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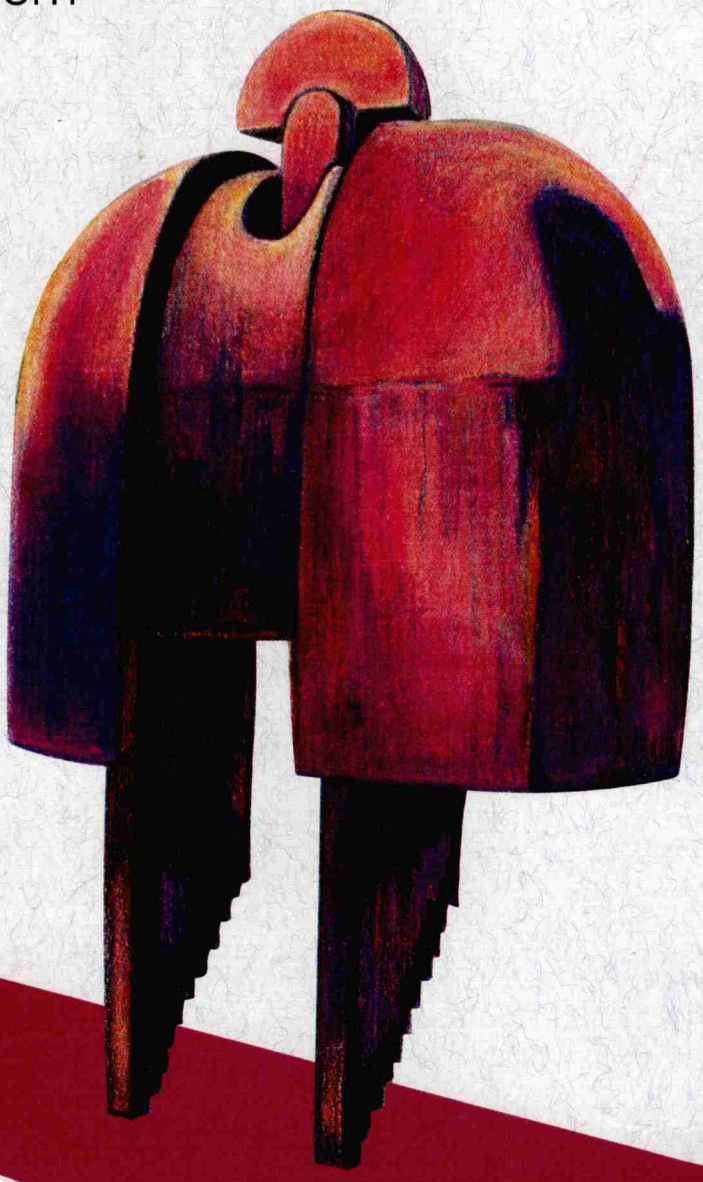
CONTEMPORARY POLICY ISSUES

An Industrial Strategy for

the Pulp and Paper Sector

Lael Bethlehem



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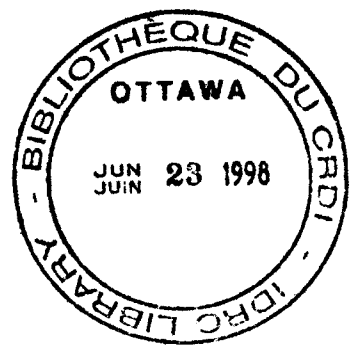
AN INDUSTRIAL STRATEGY FOR THE PULP AND PAPER SECTOR

Lael Bethlehem



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Development Policy Research Unit
School of Economics
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EDITORIAL COMMENT

This report is one of a series produced by the Industrial Strategy Project.

The ISP has its origins in the Economic Trends Research Group, a collective of economists and other social scientists convened by the Congress of South African Trade Unions in 1986. COSATU, under attack for its support for sanctions, initially asked these researchers to examine the impact of enforced isolation on the South African economy. It soon became clear that sanctions were a small aspect of the problems besetting the South African economy, and the work of the Economic Trends Research Group expanded into a full-blown analysis of South Africa's economic crisis.

The poor performance of South Africa's manufacturing sector loomed large in the litany of problems bedeviling the South African economy. The 1980s had been, in economic terms, something of a lost decade. The manufacturing sector was particularly conspicuous by its inability to create jobs, and to produce commodities that satisfied the divergent requirements of the domestic and international markets. A range of factors contributed to this malaise - apartheid's impact on the skills profile of the workforce, repressive and outmoded industrial relations systems and work organisation, a highly concentrated industrial structure and a concomitantly weak and repressed SME and micro-enterprise sector, and a highly inward oriented trade regime, were the most obvious sources of the crisis in manufacturing.

However, the solutions were less obvious than the problems, and in 1990, again at COSATU's initiation, the ISP was conceived. From the outset, the political environment ensured that the ISP would not be an ordinary research project. The unbanning of the ANC and the certainty of the immediate accession to power of COSATU's political ally, coupled with the union federation's increasingly direct role in policy formulation, ensured that the ISP focus closely on policy, contributing to the development of the industrial policy that would address the poor performance of South African manufacturing.

To this end, the ISP engaged a range of researchers with the purpose of undertaking detailed examinations of the key sub-sectors of South African manufacturing. The fruits of the ISP are to be found in the reports, such as this one, most of which are to be published by the UCT Press. The authors of the reports were assigned, generally for a period of 14 months, to the study of a particular sector. The researchers were required to study the local sector and the factors promoting and restraining its development. They were required to assess its prospects in the light of the likely global trajectory of the industry. Detailed examination of local firms were complemented by international visits that enabled the researchers to consult with international experts and visit factories to enable them to situate South African firms in a comparative perspective.

In addition to the sectoral studies, the ISP also engaged researchers to examine key cross-cutting issues. Those selected for study were human resource development and industrial relations, technology development, market and ownership structures, trade performance and policies, and regional industrial strategies.

Industrial policy is not a plan easily contained between the covers of a single document. It is a process, a process of engagement between the key industrial stakeholders. South Africa's peculiar transition has given concrete expression to this credo, with the tripartite National Economic Forum and the various sectoral task groups the key institutions and processes within which an evolving industrial policy is being developed. COSATU has played the leading role in this process. The ISP has, in turn, made a significant contribution to COSATU's capacities. It has done this by constant dialogue between the ISP and the COSATU leadership, and by a traineeship programme which saw a number of union leaders seconded to the ISP for its duration.

In addition the research process has engaged a range of key actors. Individual researchers have engaged with union and business leaders and experts within government. The ISP was punctuated by a series of intensive workshop attended by the researchers, COSATU and ANC leaders, and other local and international experts. The work-in-progress was thoroughly discussed and critiqued at these workshops and it is appropriate to see each report as owing a great deal to the ISP collective.

A number of researchers are continuing their work from within the industry task forces, the unions, and the structures of the new government. The ISP itself is moving into a second phase, taking up questions still unanswered, re-examining conclusions of the first phase and continuing the unending process of developing industrial policy. It is in this spirit that these reports should be read: they are not final plans, but simply attempts to start a vital process, one that will of necessity be taken forward by all of the major industry participants.

The Industrial Strategy Project was funded by generous grants from the Humanistisch Instituut Voor Ontwikkelingssamenwerking (HIVOS) of The Netherlands, the International Development Research Centre (IDRC), Ottawa, Canada, and the Olof Palme International Centre of Sweden. We benefitted not only from the financial resources of these institutions, but also from the wide-ranging experience of their staff members and their deep and abiding commitment to a democratic and prosperous South Africa.

Avril Joffe
David Kaplan
David Lewis
Raphael Kaplinsky

ISP Co-Directors
Development Policy Research Unit
University of Cape Town

FOREWORD

In the late eighties COSATU commissioned a group of economists to prepare a report analysing the impact of sanctions on the South African economy. We commissioned this work in response to criticism in the media and elsewhere that held us – through our support for sanctions – responsible for the sorry state of the South African economy, including the miserable conditions of our members and others whose interests and aspirations we represented.

The research revealed that the crisis of the South African economy was rooted in the policies of the apartheid era and our commission to the economists was transformed into a full-scale critique of the economics of apartheid. A key consequence of the failures of apartheid's social and economic policies was its unproductive manufacturing sector. It was unable to produce basic goods of a suitable quality and at an affordable price; it was unable to produce goods that successfully penetrated international markets; it relied on low paid, poorly trained workers, and harsh, authoritarian shop floor supervision; above all, it proved incapable of generating desperately needed employment. While manufacturing's contribution to the global economy escalated, South Africa relied increasingly on its natural resource base and the cheap labour that mined and farmed it.

Appreciation of these problems inspired COSATU to request its research collective to undertake research in support of our attempt to formulate a new industrial policy. This request flowered into the Industrial Strategy Project whose output is represented in these reports.

The research process has been characterised by considerable dialogue between COSATU, its affiliates and the researchers. We have learnt much from this interaction; we are confident that we have taught the researchers much. However this work is the output of an independent research collective. As is to be expected in an arms length relationship of this kind, we do not agree with every line of each report, we do not accept every recommendation. But with regard to its major findings, we do agree that there is a real potential for building an efficient manufacturing base, rooted in well paid, productive workers. Above all we believe, and this is endorsed by the ISP, that an independent trade union movement actively and aggressively pursuing its interests is not merely compatible with rapid and sustainable industrial development – it is a precondition.

John Gomomo
President, Congress of South African Trade Unions

Acknowledgements

Over the last 15 months I have discovered that developing an analysis of a large industrial sector is no easy task. In fact my progress in this research is perhaps best captured in the following excerpt from a popular magazine:

> The director's PA gave me a thin–lipped smile, strode towards the flip chart and motioned for me to be seated. 'This is where you are', she announced, pointing to the lowest point on her squiggle. 'You don't know what you don't know. When you've familiarised yourself with these,' she added, pointing to a pile of company documents, 'you'll be here — where you know what you don't know. If you persevere, you'll get to this point — where you don't know what you know. And finally you may eventually get here . . . where you know what you know'. She gave me another of those smiles. 'This, you see, is what we call a learning curve' (Evans 1993).

In completing this study, I too, have had to claw my way up the learning squiggle. I now find myself somewhere between knowing what I don't know, not knowing what I know, and knowing what I do know!

In learning what I have about the paper sector, I have been assisted by numerous people, and have incurred many debts.

Firstly, I am indebted to the companies which allowed me to interview their staff and visit their plants. Their openness and assistance are gratefully acknowledged — this study would not have been possible without their co–operation. In particular, I thank the five companies that formed the core of my research sample:

Carlton Paper Corporation Limited
Kohler Packaging Limited
Mondi Paper Company Limited
Nampak Limited
Sappi Limited

I am especially grateful to the individual employees who agreed to be interviewed, and who gave of their time, showing me around the plants, digging up figures and explaining the finer points of paper chemistry.

I am grateful to John Clements, Johan van Wyk and Margaret Simmons of Sappi, and to Medwyn Du Bois of Mondi, for assisting me in finding my way around their organisations.

I am particularly indebted to Sappi for their generosity in allowing me access to their excellent library. I am grateful to Mary-Ann Uys and Jayne Shepard for their expertise and assistance in this regard.

I am also grateful to the following:

- Those companies and individuals who facilitated the overseas portion of this research. In this regard, I thank Korsnas, Hannover Papier, Sappi Europe, SCA Packaging, Stora, U.K. Paper, the International Chemical and Energy Federation (ICEF), the Swedish Paper Workers Union (Pappers), Pira International, and Pulp and Paper International (PPI). Special thanks to Jim Catterson, Olle Hammarstrom, Richard Kordes, and Ian Vine.

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- The directors of the Industrial Strategy Project: Avril Joffe, David Kaplan, Raphael Kaplinsky and David Lewis. I thank them for their direction and assistance. I am particularly grateful to Avril Joffe and David Lewis who showed more faith in me than the average 'Bobba'! I also thank the Project researchers and trainees for creating an exciting and challenging research environment.

- The officials and office staff of the Paper, Printing, Wood and Allied Workers' Union for their co-operation. I am also grateful to the many PPWAWU shop stewards whom I interviewed during plant visits.

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Finally, I wish to express my thanks to family and friends for their encouragement. They have been supportive in countless ways, and I am grateful for their ongoing interest and concern. A special word of thanks is due to Laura Alfred, for her kindness, patience and support.

Table of Contents

Executive Summary

This study provides an analysis of the South African paper sector – that is, the pipeline of industries that are concerned with the manufacture of paper and paper products. The sector under discussion is made up of three sub-sectors: commercial forestry; pulp, paper and board; and paper products. Although these are distinct industries, they are inter-dependent, and together form an extended production pipeline, which I have labelled the 'paper sector'.

The study aims to provide an overview of the sector, and to assess the competitive position of its various component industries.

The Paper sector and industrial strategy

Two major concerns form the starting point for the study. These concerns are related to the South African economy in general, but impact directly on the paper sector. The first concern stems from the fact that after decades of protection and sanctions, South Africa's economy is becoming increasingly re-integrated into the international market. This re-integration is both desirable and inevitable, but presents certain dangers for our industries. International re-integration will compel local companies to compete with the best producers in the world, both in our domestic market (through increased imports), and in the international market. An inability to compete effectively will threaten the future of South African companies and their employees. The growth and survival of South African companies (and therefore, their relative competitiveness) is of concern not only to the companies and their shareholders, but to workers, consumers, and a democratic state.

This leads to the second starting point of this study – a concern with rapid and equitable economic development in South Africa. The problems of poverty, inequality and under-development need to be addressed urgently. This will not only require broad economic growth, but a specific development path – a path which seeks to address the needs of the millions of South Africans who have been excluded from political and economic power as a result of apartheid.

What is the place of the paper sector in these addressing twin concerns? Parts of the sector have been involved in substantial international trade for many years. The pulp and paper industry in particular, has become a major exporter in the last decade. More recently, exports of woodchips and certain paper products have begun to grow. The sector is in the fortunate position of having a raw material advantage in the form of fast-growing (and therefore cheap) pulpwood timber. This factor provides a crucial competitive advantage in international markets. I argue however, that the there are serious weaknesses in the industry, including evidence of crippling inefficiencies. As a result, the pulp, paper and board industries are not

fulfilling their enormous potential. At worst, these industries face real difficulties in surviving in an increasingly competitive international market.

Unlike pulp, paper and board, the paper product industries have limited experience in the international marketplace, and no inherent competitive advantage. They tend not to benefit from the cheap pulpwood resource, because the wood advantage has been eroded by manufacturing inefficiencies and pricing practises. They also suffer from various types of inefficiencies.

At the same time, the paper sector is crucially placed to address some of the inequalities prevalent in our society. Much of the sector's production is located in under-developed rural areas. The path taken by the paper industries therefore, and by commercial forestry in particular, will impact crucially on the local economies of various rural communities.

Paper is also crucial to development because of its linkages throughout the economy. The availability, quality and pricing of paper has an important impact on education and literacy, and on the possibilities for educational expansion. Other paper products also have important linkages throughout the economy. Paper packaging, for example, influences the quality and marketability of products throughout the economy.

The sector is also a important earner of foreign exchange. With the decline of some of South Africa's traditional mineral exports, the export of manufactured products, including those of the paper sector, will become increasingly important.

In addition to this, the sector also presents a challenge in terms of environmentally sustainable development. The paper-related industries internationally have been criticised for their negative impact on forest, river and marine and urban environments. There has been substantial progress in this area internationally, and it is of utmost importance that the local sector follows suit. A failure to do so will impact on our competitiveness as well as our environment.

In light of the competitive, developmental, and environmental pressures on the paper sector, I argue that a national strategic framework is desirable. The sector would benefit from a systematic and co-operative effort by major players in the industry to resolve current problems and maximise future opportunities. Such an effort would require the involvement of the companies, the trade unions, and the state.

This notion of industrial strategy seeks to harness the energies of the major players in actively and co-operatively shaping the future of the sector.

The Paper sector in international context

The South African pulp, paper and board industry occupies a small but significant niche in the international market. Our exports have grown substantially over the last decade, but still account for less than 2% of international demand. The local industry is too small to impact on the direction of the international industry, and as a result, existing international trends must be taken into account. The recent crash in international pulp and paper prices has created a crisis in the industry, and levels of investment and profitability have plummeted. South African companies have been badly effected by this development.

It is argued that the current crisis is more than cyclical in nature, and that a permanent process of restructuring is taking place in the international industry. A discussion of recent changes to the way that pulp and paper are made and sold, suggests that new developments will have a long term impact. Such developments include higher environmental investment requirements, increasing use of recycled fibre, a move towards lower production costs through various forms of total quality management, and an increase in marketing and consumer orientation. Perhaps the most important trend for South Africa is the growing international importance of southern pulp and paper producers, who are able to translate low pulpwood costs into competitive prices for pulp and paper. South Africa (like Brazil, Chile and the southern U.S.A.) has access to low-cost pulpwood, and should therefore be able to participate in the projected success of this category of producers.

South Africa's access to low pulpwood costs is therefore, of utmost importance in the development of the entire paper sector. In order to maintain the low cost of pulpwood, and simultaneously promote rural development, a series of problems will have to be resolved. These problems relate to forest labour, and environmental protection. In addition, South Africa's pulpwood resources are limited by climatic conditions, and the extent of further afforestation is expected to be limited.

The low-cost pulpwood resource is then a key to the competitiveness of the sector. However, the full potential of the pulpwood advantages have not been realised in the sector as a whole. Rather, South Africa's competitiveness has been limited to resource-intensive products such as pulp and newsprint. Products requiring greater levels of manufacturing skill and customer service (such as printing papers and paper products) are relatively uncompetitive. This pattern is consistent with a more general trend in South African industry. The trend is to "invest heavily in highly capital-intensive first stage processing for the export market, and (to produce) other products mostly for the domestic market under quite high protection" (Fallon et al 1993).

The sector exports a significant proportion of woodchips, pulp, newsprint and kraft paper, but produces fine papers and converted paper products largely for the domestic market. I argue that protection on these latter products is higher than the nominal rate suggests, and that the competitive position of these products urgently needs to be improved.

Over the last five years, the industry's growth has come significantly from export expansion, and international acquisition. Future growth will need to come from these sources to some extent, but it is hoped that local and regional markets will expand along with growth in GDP. Consumption of paper and paper products is closely linked to both GDP, and to literacy. In addition, there is scope for increased exports of South African goods, particularly in the fine paper and printing industries.

Given the constraint on pulpwood resources, the industry does not have the option of growth through an unlimited expansion of existing activities. In this light, the best possible use must be made of pulpwood resources. This suggests that the sector should use the pulpwood advantages to maximum benefit by adding as much value as possible to the raw material. In this sense, an optimal strategy would see the sector shift away from the export of woodchips and pulp in their raw form.

The overall performance of the sector is however, constrained by manufacturing inefficiencies and by the relatively high costs of paper in the domestic market. This high cost constrains the competitiveness of the manufacturers of paper products.

Manufacturing inefficiency is evident at each stage of the pipeline. These inefficiencies are illustrated in the course of the study, partly with the help of international mill comparisons. The inefficiencies fall broadly into three categories. The first is inefficiency which results from the use of outdated capital equipment. This is especially evident in sections of the paper products sub-sector, and in parts of the fine paper industry. The second type of inefficiency is associated with poor economies of scale and scope, resulting from the production of small volumes of a wide range of products in a single plant. These products are usually produced for the domestic market, under the protection of tariff barriers. The third, and most wide-spread type of inefficiency, has to do low productivities in the production process. This form of inefficiency is associated with low yields on raw material and capital equipment; high levels of waste and defects; and low levels of output per employee. These result from poor work organisation; low skill levels; and excessive managerial hierarchies. This latter form of inefficiency is closely linked to political and social relationships in production.

The three types of inefficiency described above, are not mutually exclusive, and may co-exist in a single plant.

In recent years, a number of companies have tried to respond to efficiency and quality problems by introducing higher levels of training, and various forms of total quality management. The majority of these, however, have met with limited success. The reasons for this are elaborated in the course of the study.

An industry strategy

A comprehensive industry strategy is needed to meet the competitive, developmental and environmental challenges faced by the industry. I argue that one way to achieve this is to establish a tri-partite body, to develop and implement such a strategy.

In the final section of the study, I suggest the broad outline of a strategic direction for the industry. This would involve a move to develop our competitiveness, not only in the 'first-stage' resource intensive products such as woodchips, pulp, newsprint and kraft paper, but also in the more manufacture intensive fine papers and converted paper products. I argue that while these latter products have been shielded from the international market in the past, they will need to develop a more competitive position in response to various factors such as new export opportunities, rising levels of imports, and the changing needs of local customers.

New state and industry policies would be needed in order to achieve this direction. The policies would be centrally aimed at addressing the various types of inefficiencies discussed above, and at reducing the cost of paper in the domestic market. In this way, it is hoped that the sector will compete more effectively in those areas where a level of competitiveness has already been reached, and will develop a competitive position in the areas in which we are currently uncompetitive.

Policies to address inefficiency include a process of reforming workplace organisation, and redirecting the system of investment and export incentives. Changes in work organisation will also have the effect of empowering workers, and reducing racial and political inequality on the shopfloor. Fundamental changes to the training system are also recommended. Such changes would require substantial investment, but would lift the level of skills in the sector substantially. In addition, a revamped training system would provide career opportunities for workers, lift real wage levels in the medium term, and resolve the entrenched centralised bargaining conflict in the sector.

The policies also aim to address key environmental and developmental problems. Among the environmental issues are the need to reform the Afforestation Permit System, to develop a national recycling strategy, and to tighten controls on effluent and emissions. Among the developmental problems, are the need to ameliorate wages and working conditions in forestry, improve health and safety auditing, and develop a national housing strategy for workers in the sector.

Finally, efficiency improvements are likely to lead to some employment loss in existing mills and factories. However, growth in domestic and regional demand, and in exports, should lead to employment expansion in the medium term. Policies aiming to deal with the impact of any short-term employment losses are discussed.

Chapter 1: Introduction

South African paper – an industrial success story

The pulp and paper industry is one of South Africa's industrial success stories. In 1920 the industry comprised a single, tiny paper mill, which relied on imported pulp, and produced only low grade packaging paper. By 1940 a new mill produced pulp and paper from straw. By 1993, the industry has grown into a manufacturing giant, providing 85% of paper consumed by the domestic market and exporting a third of its products. In contrast to most of the manufacturing sector, the industry grew steadily during the 1980s. The industry is now an important earner of foreign exchange, and directly provides almost 20 000 jobs in urban and rural areas. South African companies such as Sappi and Mondi are expanding internationally, acquiring paper mills in Germany, Austria and the United Kingdom.

The pulp and paper industry is however, only one part of the paper pipeline or paper sector. By pipeline I mean the set of industries which make paper-related products. The pipeline begins with the multi-billion rand commercial forestry industry (At present the pulp and paper industry consumes over 40% of the forestry industry's total wood crop). The pipeline then moves through the pulp and paper manufacturers themselves, and on to the manufacturers of paper products. These products include paper packaging of various types, tissue and disposable products, printed goods, including school and business stationary, and publications such as books and magazines. Manufacturers of these products are referred to as converters, because they convert paper into paper products. When this chain of industries is considered as a whole, we see that the paper sector is extremely diverse, and has important linkages throughout the economy. This study is concerned with the pipeline – the paper sector as a whole.

Is there a need for an industrial strategy in the paper sector?

Is the paper sector as successful as it could be? Has it fulfilled its vast potential to meet the needs of South African consumers; to export high value-added goods; to generate economic growth? Does it make maximum use of South Africa's valuable timber resource, and our natural advantages in climatic conditions? Does it develop our human resource to the fullest? In short, have the companies which make up the paper sector followed an optimal set of strategies? Optimal not only for the individual companies and their shareholders, but for their employees, for the sector as a whole, and indeed for South African economic development. In this study I argue that the enormous potential of the paper pipeline is not being fulfilled, and that there are real dangers which threaten the future of the sector. In summary, the problems are threefold:

- The sector is most competitive in producing those products which are relatively low in value, and relatively close to a raw material state. The sector relies largely on cheap raw materials for its competitiveness, and has a limited ability to convert this material into higher value products.

- A lack of national vision for the industry has produced practises which promote some parts of the sector at the expense of others. One result of this is that the natural advantages which accrue from South Africa's cheap timber resource are not passed on to the converters of paper products, despite their potential for adding value and creating jobs.

- In the context of increased international competition, South Africa will struggle to compete, because of manufacturing inefficiencies. International comparisons documented in this study show that South African paper sector manufacturers are less productive and efficient, and more wasteful than their competitors. Some of this inefficiency is rooted in industrial and management policies which emerged under apartheid. The present downturn in paper prices have placed pressure on South African companies, and their performance suggests that they cannot continue to compete in the long term at present levels of efficiency.

These problems are elaborated in the course of the study. What becomes clear is that the future success of the paper sector is not guaranteed, and the sector's development would benefit from a conscious industrial strategy. Such a strategy would go beyond individual company plans, and beyond government trade policy — the traditional elements of industrial planning in South Africa.

Industrial strategy and national economic development

Is there a case for the notion of industrial strategy — a set of policies which go beyond reliance on the market?

Every country faces a choice about whether to pursue active industrial strategy. This choice is part of a wider set of economic policy decisions that provide a framework for economic activity. The industrial strategy option means that the state (along with organised employers, and possibly labour) plays an active role in shaping industry. It is an option that was rejected by Reagan, Thatcher and Bush, who preferred to leave industrial development up to the market. But it is an option that has been embraced, in one form or another, by successive post-war Japanese and South Korean governments, by the Clinton administration, and the Australian Labour Party.

In the coming years, South Africa will face a choice about whether to pursue national industrial strategy at all, about what sort of strategies to pursue, and how to implement them. If we seek to apply an active, national strategy to the paper sector in particular, we will need to make choices about what that strategy should aim to achieve, and how it would work.

This study aims to explore the various options available with regard to the paper sector and to arrive at some conclusions as to which options are most desirable.

In terms of the initial choice about the desirability of a national industrial strategy, I argue that, at this point in South Africa's history, industrial strategy has an important role to play in economic development and reconstruction. The South African economy is in decline, and is unable in its present form, to provide the basis of social and political reconstruction after apartheid. Levels of unemployment, inequality, poverty, violence, and crime are high, and a new direction is urgently needed. The reconstruction of our society, however, is unlikely to succeed without a steadily growing economy, which will include a competitive manufacturing sector. A national strategy for economic and industrial development could provide a basis for economic revival.

There is a need then, for rapid economic development, stimulated by a national development strategy. Such development must aim at social reconstruction, and long-term economic growth. A successful manufacturing sector is likely to be key to sustainable long-term development. Industrial strategy for the key manufacturing sectors, including the paper sector, could be an important element of this program.

This notion that industrial strategy can be used as a tool of development has a number of implications. It assumes that industry has a key role to play in the generation of wealth (or more broadly economic growth), and that this wealth must be useful in addressing poverty, inequality and powerlessness. But beyond that, I argue that the *process* of wealth creation or *economic* growth can be used to address inequality — for example, through targeted human resource development. The *process* of industrial growth, as well as its outcome, are important then, in addressing current social problems.

This notion of industrial strategy is partly inspired by the successful post-war industrial development in countries like Japan and South Korea. Many in the West ascribe these successes to cultural factors, or to a particular work ethic. But as Michael Best (1990) argues, Japan's success cannot be explained without reference to the national process of industrial strategy, in which the state played a key role. Similarly, Alice Amsden (1990) and Ha-Joon Chang (1993) have argued that strategic and selective state intervention have been crucial in fostering industrial development in South Korea.

Best shows that one of the most important forces behind Japanese industrial development was the Ministry of Trade and Industry (MITI). MITI worked to create industry councils which brought companies together to strategise and create a common vision. The perspective has been to try to create success for that branch of Japanese industry, rather than for some Japanese companies at the expense of others. In so doing the industry councils do not suspend the market, or discourage competition between companies. Rather they manage a creative tension between market and plan, competition and co-operation.

In the South African context there are two important motivations for an explicit and targeted set of industrial strategies, (including an industrial strategy for the paper industry). These concern competitiveness and redistribution, and are discussed below.

Competitiveness and industrial development

South Africa has, for some time, been partially shielded from the international economy through tariff barriers and sanctions against apartheid. We now face a choice about whether to fully re-integrate into the international economy. That choice, however, will be circumscribed by processes in the international economy itself — notably the General Agreement on Trade and Tariffs. I argue that it is both difficult and undesirable for South Africa to try to de-link from the international economy. Selective protection from the world economy may still be desirable in certain areas of our economy, but in general, and in the longer term, we will need to compete in world markets.

In that context, complete re-integration into the international marketplace is an important economic milestone, but one which is fraught with dangers. The future success of our industrial development, will depend largely on our companies' ability to sell products and services, both at home and abroad, in competition with the most efficient and advanced producers in the world. The phasing out of prohibitive tariff barriers and/or sanctions, will open enormous opportunities for South African companies, but will also launch South Africa into a highly competitive environment. South African industries, including the paper sector, will have to compete, or they will not survive into the Twenty-First century. The ability to compete internationally then, is not so much an objective of an industrial development strategy, as it is a constraint on development strategy. An inability to compete internationally forecloses industrial development. In this sense international competitiveness is a precondition for development, rather than the objective of development.[1]

A successful industrial strategy would help South African companies to negotiate their re-entry into international markets, and to compete successfully in those markets.

Industrial development and redistribution

The second motivation for industrial strategy lies with the notion that wealth not only has to be created, but also used and distributed in a way that addresses the imbalances in our society. In order to address inequality and promote development, we will need to redistribute both wealth and power. In this light, I argue that the type of industrial strategy that is needed in South Africa today, is a strategy that promotes rising real wages, increased employment and a strong trade union movement.

[1]I am grateful to Robin Murray for his insights on this point.

What is the role of trade unions in such an industrial strategy? It is possible to design and implement industrial strategy without the involvement of a strong independent trade union movement. Indeed it is possible to design an industrial strategy which seeks to exclude and weaken independent trade unions. This was arguably the path chosen by the Japanese. I argue however, that there are compelling reasons to involve South Africa's trade unions in formulating and implementing industrial strategy.

The South African trade union movement is a powerful and dynamic organisation which is increasingly active at the national economic level. The Congress of South African Trade Unions, COSATU, in particular, has followed a direction which seeks to serve not only the narrow interests of its members, but also promotes broader economic development and change. It this sense it seeks to represent not only its members, but working people and the unemployed as well. COSATU's involvement in the National Manpower Commission and the National Economic Forum underline the Federation's commitment to economic reconstruction. According to COSATU General Secretary Jay Naidoo, the Federation's involvement in the National Economic Forum aims to "identify the framework within which we are going to try to resolve economic problems . . . we will be able to bring about a fundamental transformation of our country at an economic level" (Quoted in von Holdt 1992). Such involvement suggests that objectives such as redress of inequality, employment creation, upgrading of working conditions, and empowerment of working people, would be pursued in the context of economic growth and reconstruction. The trade union movement has therefore situated itself as an important player in creating and implementing an economic development strategy.

The influence of the trade unions, however, is not limited to the national economic level. At industry and plant level, there are various initiatives (notably in the clothing, mining and metal sectors), to involve workers and trade unions in decision making.

There are several advantages to involving trade unions in industrial strategy at the sectoral level. Firstly, an industrial strategy which includes trade unions is, in South Africa today, much more likely to be feasible than one which does not. Trade unions are a force to be reckoned with in almost every sector of manufacturing, and the paper sector is no exception. Secondly, trade unions and their members are good source of industrial regeneration. In Australia since the mid-1980s for example, the trade union movement has been a driving force behind efforts to make Australian manufacturing more competitive. Because the unions are in touch with the shop-floor, and because they often organise across an entire pipeline, they have been a good source of strategy. Given that South African workers have largely been excluded from shop-floor and industry decision-making, it may well be that they represent an untapped source of knowledge, insight and innovation. A third reason to include trade unions and their members in industry strategy, is that it creates the opportunity to empower a historically disadvantaged group, and to build greater democracy in the workplace. If South Africa is to make the transition to a truly democratic society, the process of empowerment and democratisation is important in every sphere. Finally, trade unions should be involved in industry strategy simply because such strategy will impact on trade

union members. Unions must be present to negotiate the path of the industry, and to represent the interests of workers in that process.

In the paper sector, the 43 000-strong COSATU affiliate, the Paper, Printing, Wood and Allied Workers Union (PPWAWU) has the strength and reach to form an integral part of an industry strategy at various levels. I argue that its involvement would be both necessary and desirable in the design and implementation of industrial change.

The participation of trade unions in industrial strategy is, however, a politically complex affair. The formation of industrial strategy may involve competing or even contradictory agendas on the part of management and the trade union. The process raises the difficult question of how far co-operation between labour and management is possible in contemporary South Africa.

Co-operation between labour and management?

The idea of union involvement in industrial strategy presents another important choice – this time to trade unions such as PPWAWU. A union would face various options with regard to industrial strategy formulation and implementation. These options range from seeking full and equal involvement in the process, to rejecting any involvement at all. Between those extremes lie a variety of positions which a union may adopt.

There are indeed dangers for an independent union in pursuing an active role in industry strategy and policy. There is the danger that by taking on the competitive concerns of industry and private companies, the union may compromise the needs of its members. How are the members' needs for job security, for example, reconciled with companies needs for a slimmer workforce? How is the union's need for strong organisation and identity reconciled with companies' needs for worker loyalty? Will the role of the shop steward be undermined by the notion of teamwork? On the other hand, a union faces the danger that by pursuing the needs of its members too closely, it may be accused of compromising the needs of the consumer or the unemployed. So it may be easier to stand aside, and allow the companies and the state to solve their own problems.

I argue that despite these dangers, it is in the South African trade union movement's best interests to involve itself actively in formulating and implementing industrial policy. Such an involvement would allow unions to negotiate the short term and long term interests of its members, and to play a role in shaping the industry and the economy. If unions were excluded from industrial strategy, there would be no opportunity for workers to influence the direction of the industry.

In saying this, I do not wish to imply that management and organised labour will share the same agenda in the process of forging industrial strategy. Workers should not be expected to subsume their interests under those of management, in the name of economic development. By the same token, companies cannot be expected to transform themselves into

development agencies. The two groups do have some common interests (such as the survival of the companies, and the overall growth of the economy), as well as some conflicting interests. It would be possible to forge a limited scope of co-operation, in which capital and labour continue to pursue their own interests, but do so in a framework that benefits both parties and the process of development.

There would, of course, also be opposition to union involvement within the ranks of management. Full union participation in industrial strategy would compromise traditional managerial prerogatives. In addition, it could be argued that international firms are less likely to invest in South Africa if they are made to incorporate trade unions in their business decisions. But it may be that local and international firms will be able to see beyond these traditional perspectives, and recognise that, in South Africa at least, there will be real advantages in seeing unions as a *resource* in the process of industrial development.

How would an industry strategy work?

Here again we face a range of options in designing an industrial strategy. We could emphasise state trade policy, or inter-firm co-operation. We could concentrate on restructuring individual enterprises, or on a national training program. In considering these options, I argue for four major mechanisms, which go beyond existing market structures:

- Targeted state policy which works towards a development path for each industrial sector.

- Specific forms of co-operation between companies in the industrial sector, within the bounds of competition.

- An increased role for the industry trade union in shaping broad industry policy and workplace organisation.

- A re-structuring of the national training system, including a specific national plan for the paper sector.

The existence of an industry strategy suggests the need for a tri-partite forum at the industry level. A tri-partite forum would link state, company and worker concerns and initiatives. The idea of a tri-partite forum at industry level is not new to South African industry. Such fora already exist in the clothing and textile industry, the auto industry and the mining industry. The National Economic Forum represents a similar process at a national economic level.

However, most tri-partite fora in South Africa have been created out of a sense of crisis. Typically, the unions are only invited to involve themselves in industry strategy and policy when the industry finds itself in trouble. Unlike mining, the paper sector is not facing the kind of a crisis that threatens its very existence. But it does face a range of serious problems, and it could be said to be squandering opportunities for itself and for the national economy.

A tri-partite forum would be appropriate then, not because of a threat to the industry's survival, but because there is a need for change.

The success of such a forum would dependent on many factors. It would depend on the willingness of companies to work for the success of the South African industry as a whole. It would depend on the willingness of manufacturers to work with converters and vice versa. It would also depend on the capacity of the trade unions and the state to involve themselves in industry strategy in a useful and informed way.

But the rewards provided by such a forum could be enormous. The industry already co-operates to some extent over training, forestry research and public relations. It could also co-operate in fostering a more competitive industry, in moving towards higher value-added manufacturing, in establishing improved employment standards, and in protecting the environment. Companies and unions could co-operate in improving efficiency, productivity and work organisation. And the industry could co-operate with the state in forging tax policy, tariff policy, investment and export incentives which would be best suited to the needs of this particular industry.

In short, such a forum could create and implement a vision, a strategy, and a set of policies for the paper sector.

What sort of strategy for the paper sector?

What would an industry strategy for the paper sector look like? It would aim to maximise the following economic or social benefits:

- The creation of formal sector employment.
- The earning of foreign exchange through exports, and savings on imports.
- The improvement of working conditions and the empowerment of working people.
- The development of human resources.
- The establishment and maintenance of a tax base, and of ongoing investment in the South African economy.

We also need to note that the paper sector has particular linkages throughout the economy. Firstly, the availability and price of paper has an important impact on the possibilities for educational expansion. The development of the paper sector therefore has important social consequences with regard to education and literacy. The paper sector also impacts on other parts of the economy. In particular, the availability, quality and price of paper packaging influences the sale of countless products. Packaging not only impacts on the price of various products, but also influences their transportation, export potential and marketing.

The paper sector also presents particular dangers, in particular, with regard to the environment. There has been controversy both locally and internationally over the impact of paper manufacture and disposal on the environment. A lack of careful management will not

only threaten the environment, – it could also compromise the commercial success of the industry. Careful environmental management is therefore necessary to ensure sustainable development.

In aiming to achieve these broad economic and social objectives, a paper sector strategy could travel a variety of paths. In particular, players in the industry will need to make a choice about whether to pursue a resource intensive strategy, which emphaisies the need to compete in the commodity grades via cheap raw materials, or which seeks to compete through adding value to our raw materials. I argue for a broadly value-adding approach, which comprises three main elements, each of which will be examined briefly below:

1. Adding value to our raw materials
2. Passing our natural timber advantages along the pipeline
3. Addressing manufacturing inefficiency

Adding value to our raw materials

South Africa has a fundamental comparative advantage over many other producers because we belong to the category of countries (largely in the southern hemisphere) where trees grow quickly, due to favourable climatic conditions. In a slow-growing country like Sweden, trees are ready for harvesting after 60–80 years, depending on the wood type. In fast-growing countries like South Africa or Brazil, timber is ready to be felled after 7–20 years. This 'fast-growing timber' resource translates into cheaper wood. At present, South Africa's wood costs are around 25% lower than the average costs faced by our major international competitors. This is largely, although not exclusively, due to the timber growth patterns.

Since the wood component consists of up to 50% of the final cost of producing pulp, and pulp costs are a high proportion of the cost of producing paper,[2] it follows that South Africa should be a highly competitive producer not only of timber, but of pulp and paper too. If we extend this logic, and say that paper costs are a high proportion of the final cost of producing paper products (like corrugated boxes and other paper packaging, tissue products and printed books), we can conclude that South Africa has the potential to be a highly competitive producer of converted paper products.

Our natural advantage in terms of wood costs are supplemented by the relatively cheap energy available to industry in South Africa. At present, our paper companies pay 13% less for their energy than the average of our major international competitors (Edwards 1990). Energy costs comprise 3%–5% of the cost of producing pulp, and up to 15% of the cost of producing paper, this is another important advantage.

[2]The exact proportion depends on what type of paper is being produced. In resource-intensive papers such as newsprint and packaging paper, pulp forms 50–60% of cost. In uncoated fine papers, pulp is 30–40% of total cost. In the case of certain coated papers the proportion is much lower at around 10–15%.

South Africa does suffer certain disadvantages such as high transport costs in delivering our products into the final market. South Africa's total distribution costs are around 10% higher than the average enjoyed by other exporters, because of our geographical position. Transport costs for export can form up to 15% of final cost.

This problem notwithstanding, South Africa has structural advantages over other paper producing countries, and should be in a position to produce pulp, paper and all kinds of paper products more cheaply than our northern competitors. This could provide the basis for exporting pulp, paper and paper goods, as well as meeting the needs of the South African market.

The present reality however, is that South Africa is a highly competitive producer of pulp and *resource-intensive* papers such as newsprint and packaging paper, and a less competitive producer of *manufacture-intensive* products such as printing and writing papers and converted paper products. By resource intensive, I mean that the product requires relatively little manufacture. stated another way, such a product requires relatively little transformation from the raw material to the finished product. A manufacture-intensive product, on the other hand, goes through more stages of production, and is sometimes called an elaborately transformed manufacture (ETM).[3]

In this industry a resource-intensive product is, for example, a low value paper, such as newsprint. Such as product is sold as a commodity on world markets, and is usually subject to international prices. Manufacture-intensive products would be either higher value papers (such as most printing and writing papers) as well as converted paper products (which range from a corrugated box to printed book.)

Perhaps the clearest way to measure the competitiveness of our various products is to look at our export performance. South Africa exports a high proportion of resource-intensive products. Pulp, newsprint, and packaging paper comprise 84% of the volume of our paper-related exports. Printing and writing papers, paper packaging, tissue products and printed products together comprise only 15% of exports. We export very little in the way of converted paper products. Some products, like corrugated boxes enjoy a degree of export, but at present this comprises a very small proportion of production.

South Africa then, is a highly successful producer and exporter of resource-intensive products (pulp, newsprint and corrugating papers), and a relatively unsuccessful producer and exporter of manufacture-intensive products (printing and writing papers, and converted products like packaging and printed products).

One might argue that the South Africa should continue to rely on producing and exporting resource-intensive products. After all, our major comparative advantage lies in our wood

[3]This term is used by, among others, the Australian Manufacturing Council.

resource and the wood cost is a larger proportion of the final cost of producing resource-intensive products, than it is for producing manufacture-intensive products. We could argue that South Africa should stick to those areas where we already have an advantage rather than trying to enter complex, value-added arenas. But there are four main problems with competing via resource-intensive rather than manufacture intensive products.

The first is that manufacture-intensive products are also higher value products. As such they not only fetch higher prices on world markets (and therefore earn higher levels of foreign exchange), but they are also less vulnerable to the price instability which affects commodity products such as newsprint. If we were a major exporter of non-commodity products, not only would our foreign exchange earnings be higher, but our companies would not suffer the extremes of the commodity price cycle. We would, as the Financial Times recently put it, be able to "get off the price roller-coaster" (Abrahams 1992).

The second problem concerns employment. The more manufacture is required to transform a product, the more jobs are created. The production of converted products (like packaging, tissue products, and printed goods) is much more labour intensive than the production of paper, particularly resource-intensive paper. If we want to create more employment through the pulp and paper pipeline, we need to shift emphasis towards higher value and converted goods. In addition to this, both converted goods and higher value-added papers require greater levels of skill development. By producing manufacture-intensive products, we would create not only more jobs, but also the kind of jobs that encourage the ongoing development of our human resources.

The third problem concerns growth. Over the last decade, printing and writing papers internationally have seen more growth in consumption and sales than other grade of paper. Consumption of printing and writing papers grew by 60% over the 1980s, while growth of newsprint and packaging papers grew by 28%. Printings and writings not only represent a more valuable market therefore, but also the fastest growing market in the world.
The fourth problem concerns the availability of wood in South Africa. South Africa relies on plantation forests for our timber resource. These are forests which do not occur naturally, but which have been planted for the specific purpose of growing commercial timber. Such forests can only be planted in certain areas, where rainfall and other factors are suitable. South Africa has now reached the point however, where little further afforestation is possible. It is estimated that South Africa cannot increase commercial forest plantations much further, and certainly not by more than one third, or about 300 000 hectares. Since our timber resource is limited, it is important to find the optimum use for this precious resource, and the more valuable products represent a more intensive use of timber in the local economy. In the longer term, given continued expansion in the South African paper sector, it is possible that we will reach the limits of local wood supplies, even if alternative sources of fibre (such as increased recycled fibre) are developed. In such a situation, further growth would rely on an ability to produce pulp and paper efficiently, even using imported raw materials. This implies that reliance on competing primarily through cheap materials is unsustainable in the long term.

These factors all point to the need for the South African sector to develop in the direction of adding value to our timber resource. An industry strategy for the paper sector would need to address the obstacles to such a path, and suggest mechanisms for pursuing a value-added direction.

There are two major obstacles to following this direction. The first concerns pricing policy, and the second concerns manufacturing inefficiency.

Passing our natural timber advantages along the pipeline

We noted above that South Africa's fast growing timber resource provides a key advantage in paper production, and could act as a springboard for competitive advantage throughout the pipeline. At present, however, their are two problems in bringing this into effect.

The first problem is that our wood-cost advantage is eroded, first through manufacturing inefficiency in pulp production, and subsequently through inefficiencies throughout the pipeline. The cost of waste, maintenance and downtime, is significantly higher in South African mills and factories, than it is in mills which represent international best practise. These production process inefficiencies are compounded in some areas, by the use of outdated capital equipment.

The second problem is that South Africa's wood cost advantage is restricted to the manufacturers of pulp and paper. Given our wood-cost advantage, and despite manufacturing inefficiency, we produce pulp approximately 10% below the cost of our northern competitors. Newsprint and packaging paper is also produced in South Africa around 10% more cheaply than the international average, while printing and writing papers are close to the world average. However, the price of pulp and paper charged to domestic buyers tends to be about 10—15% *above* world prices, partly as a result of import parity pricing.

We therefore have a situation where a significant wood cost advantage, resulting from a natural resource, is beneficial to only part of the sector, rather than forming a springboard to competitive manufacture throughout the sector.

With greater manufacturing efficiency in the production of pulp and various papers, and with a different pricing practise, South Africa would be in a better position to develop downstream manufacture in the paper sector — i.e., manufacture of converted paper products.

If we are to follow a strategy which encourages the addition of value to our raw materials, we will have to address pricing policy, and in particular, the role of import tariffs in inflating local prices. We will also have to address manufacturing inefficiency. This is discussed below.

Addressing manufacturing inefficiency

In this study I choose to talk of 'efficiency' rather than, for example, 'productivity'. I prefer this term because it takes into account the whole range of factors which cause poor production, including the type of technology employed, work organisation and social relations in production. I argue that there are three main types of inefficiency in the paper sector. These are:

- Inefficient use of world-scale and world class technology. This occurs when advanced technology is in place, but its performance is below potential as a result of factors such as poor work organisation and low skill levels.

- Inefficiency which results mainly from import substitution in a small market. This occurs when one plant produces small volumes of a wide variety of grades. This is done in an effort to meet every market need, in a small fragmented market, and thus to substitute for imports. Such practise deprives the plant of economies of scale and scope and results in inefficient production of commodity paper grades, relative to international competition. Such a strategy can only succeed with tariff protection. The problems associated with this type of production may be exacerbated by inefficiencies resulting from poor work organisation and low skill levels.

- Inefficiency which results mainly from inadequate and out-dated technology. This occurs when the technology employed is way behind the best available technology, and therefore uncompetitive relative to international best practise. This sort of production can only survive in a context of limited competition.

An industrial strategy, and a value-added strategy in particular, would need to address all these types of inefficiency, and design programs and policies aimed at addressing these problems.

Conclusion

In summary, South Africa faces a set of options with regard to industrial strategy in general, and an industrial strategy for the paper sector in particular. In this study, I argue that in South Africa today, industrial strategy is desirable in general, and is desirable for the paper sector in particular. I argue that the sector would benefit from a strategy which is designed and implemented by the companies, the state and the trade unions. The strategy should aim to increase the value of our paper and paper products, through addressing such issues as raw material availability, pricing policy, and various types of manufacturing inefficiency. The ways in which this could be achieved are explored in the course of the study.

Chapter 2: Research methodology

This study was conducted as part of the Industrial Strategy Project of the Economic Trends Research Group, between January 1992 and March 1993. The Project was based at the Universities of Cape Town, Natal and the Witwatersrand. This paper sector study was based at Wits University, and was housed within the Sociology of Work Unit.

The research had a number of aims. One of these was simply to collect information on the sector, in order to be able to understand its position in the national economy. Beyond this, I aimed to assess the international competitiveness of the sector, and its ability to make a sustainable contribution to future economic growth. My assumption has been that if a sector is internationally competitive, it will be able to generate ongoing employment, foreign exchange and investment in the South African economy. I also aimed to understand the trends in the industry, both locally and internationally, which would impact on the future development of the sector. In particular, I aimed to assess the impact of any changes on workers in the industry. Finally, I aimed to suggest strategic and policy directions which would enable the sector to contribute fully to an economy which is both growing, and addressing the current inequalities in our society.

The scope of the research

This study made use of the 'pipeline' or 'filiere' approach, in that a series of inter-related industries were considered as a whole. In this case, South Africa's paper-related industries (starting with commercial forestry and ending with printing), were considered as a pipeline, and defined as 'the paper sector'. The sector is made up of three sub-sectors: forestry and pulpwood chips; pulp, paper and board; and paper converting. Paper converting is in turn made up of a variety of converted paper products, including paper packaging, tissue and disposable products, printing and publishing.

The advantage of the pipeline approach is that the study analyses the entire chain of industries. These industries are connected through the life cycle of a series of inter-related products.

Research was conducted in all the paper-related industries which make up the sector. However, given limited time and resources, it was not possible to allocate equal time to all the industries concerned. As a result of this constraint, I decided to concentrate the research effort more strongly on the pulp, paper and board industry, given its centrality to the sector. In reading the study it will thus be noted that greater detail is provided on pulp, paper and board than on forestry/ woodchips, or paper converting. This is particularly so in the section on international trends.

It should also be noted that not all elements of paper converting were covered in the research. The paper converting sub-sector is very wide ranging, and I chose to cover those industries which make up the bulk of converted products. These include corrugated boxes and folding cartons, paper sacks, tissue and disposable tissue products, continuous forms and other paper stationary, general printing, book printing and magazine printing.

The research method

During this research, I employed various methods. Much of the information was collected via in-depth interviews with companies, trade unions, state departments and other players in the industry. Over fifty such interviews were conducted. In addition, extensive plant visits were undertaken. During these visits, information on strategy, production, marketing, and human resource management was collected from plant management. I also interviewed shop stewards from various unions at he plant level. Where possible, I met with supervisors and foremen. I visited a total of 14 plants comprising:

- Forests operations: 2
- Pulp and Paper mills (including pulp mills, newsprint, kraft paper, uncoated and coated fine paper mills): 6
- Board mills: 2
- Corrugated box plants: 2
- Tissue and disposable product plants: 1
- Folding carton plants: 1

The printing industries were covered through company interviews and surveys, but were not backed up with plant visits.

Company participation

The following companies formed the central research sample:
- Carlton Paper Corporation Limited
- Kohler Packaging Limited
- Mondi Paper Company Limited
- Nampak Limited
- Sappi Limited

In addition, the following companies were interviewed:
- Caxton Limited/CTP
- Haddons Trading
- Peters Papers
- SilvaCel
- Spicers Limited
- Waltons Stationary Company Limited

I also conducted a survey of major educational publishers, to assess the impact of paper on educational publishing.

Companies' right to confidentiality is respected in this study. All information collected during the course of the research is used to provide a picture of the industry as a whole, rather than the specific companies. Where company-specific information is noted, only previously published information is used.

Wherever I have quoted or referred to interviews in the course of the study, I have noted only the place and year of the interview. This is done in order to protect identities of companies in this highly concentrated sector.

Trade Union participation

The Industrial Strategy Project conducted its work in consultation with the Congress of South African Trade Unions (COSATU). In the course of this study I consulted with, and was assisted by the Paper, Printing, Wood and Allied Workers' Union (PPWAWU), the COSATU affiliate organising in the paper sector.

Plant-level interviews were also conducted with shop stewards from two other unions organising in the sector — the South African Typographical Union and the Iron and Steel Workers Union.

Other organisations

In addition to the companies and trade unions named above, the following organisations were interviewed or consulted during the course of this study:

- The Board of Trade and Tariffs
- The Competitions Board
- The Council for Scientific and Industrial Research — Forestek
- The Department of Water Affairs and Forestry
- Earthlife Africa
- Farmworkers' Research and Resource Project
- Faull and Van der Riet Manufacturing and Retailing Consultants
- Forest Owners Association
- Group for Environmental Monitoring
- The Industrial Development Corporation
- Labour Research Service
- Packaging Council of South Africa
- Simpson McKie Inc.
- The Wildlife Society of Southern Africa

The international research component

The study sought to consider the South African paper sector in the light of international developments. To this end field work was conducted in the paper sector in Europe. I visited companies, plants, universities, employer federations and trade unions in Belgium, Germany, Sweden and the United Kingdom. International comparisons contained in the study are based on these interviews, as well as on published data.

In addition to the international trade unions named above, and various pulp, paper and packaging companies, I consulted the following organisations as part of the international component of my research:

- Confederation of European Paper Industries (CEPI)
- European Disposables and Non-woven Association (EDANA)
- German Paper Workers Union (IG Chemie-Papier-Keramik)
- International Chemical and Energy Federation (ICEF)
- Pira International
- Pulp and Paper International
- Swedish Employers' Confederation
- Swedish Forest Workers Union
- Swedish Paper Workers Union (Pappers)
- Swedish Pulp and Paper Association
- University of Manchester Institute of Technology (UMIST)

Sources of statistical data

The standard source of statistical information for this study is *Pulp and Paper International*[4] (PPI) and various PPI publications including the *PPI Fact and Price Book*. Such data includes production, trade and price statistics. All other data sources are specifically acknowledged.

[4]*Pulp and Paper International* is published by Miller Freeman Incorporated and is edited by John Pearson.

Chapter 3: The world of paper making

International trends in the paper sector

3.1 International competition: the big fish in pulp, paper and board manufacture

The production and sale of pulp and paper is an international affair. In 1992, the world produced a total of 164 million tons of pulp, and 246.5 million tons of paper and board. 16% of world pulp production, and 25% of world paper and board production were traded on the international market.[5]

Successful pulp and paper production depends on a variety of factors. One of the basic factors is the supply of wood, the basic raw material for pulp production. Another is the supply of capital, the industry being highly capital intensive. Countries with large forest reserves and developed economies have therefore traditionally dominated the international scene. North America and the Scandinavian countries are the traditional giants in the industry. New regions are however, developing. Japan is now the second biggest paper and board producer, despite a relative shortage of forest resources; and newly industrialised countries like Brazil, Indonesia and Malaysia are growing fast.

The industry is still dominated by North America, but the gaps are beginning to close. The 1980s saw output growth in regions which were previously small producers. These regions, including Latin America and Asia, are beginning to challenge the traditional giants. This is illustrated on the following page:

[5]All statistics quoted in section 3.1 are sourced from the following publications: *Pulp and Paper International Fact and Price Book* 1991 and 1992; *Pulp and Paper International* July 1992, *Pulp and Paper International* September 1992, *Pulp and Paper International* July 1993.

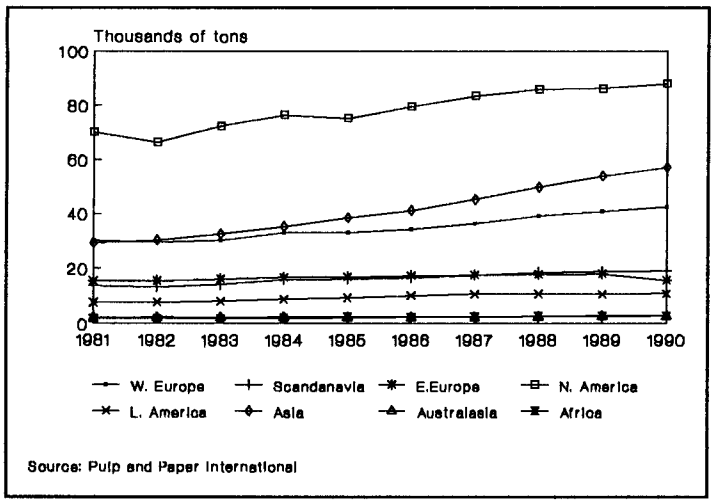

Figure 1 Regional growth in paper and board output 1981-1992

While the gap between North America and the rest of the world remains large, it is narrowing — particularly with regard to Asia's increasing share of paper and board production. Figure 1 (above) shows that during the 1980s, Asia was the fastest growing producer. Asia's share of total paper and board production rose from 17% in 1981 to 26% in 1992. For the same period, North America's share dropped from 41% to 37%. This is mirrored in the performance of the two region's largest producers — in the same period, the USA's share declined from 33% to 30%, and Japan's share rose from 10% to 12%. Japan, however, is not the only large or growing producer in Asia — China is a paper 'super-power' (although very little of its product is traded.) South Korea, Indonesia and Thailand all have paper industries which are growing fast. If present trends continue, North America's long standing dominance of the sector could be challenged, although at present its lead is still sizable.

Latin America fared relatively well in the 1980s, particularly in pulp production, where its share of world pulp increased from 3.9% in 1981 to 4.5% in 1990. Its share of paper and board remained stable at 4.5%. Brazil continued its dominance of the region, increasing its share of the continent's pulp production from 56% to 61%, and its share of paper and board from 43% to 44%.

Western Europe (excluding Scandinavia) retained its paper and board market share of 17%, and its pulp share at 7%. Germany performed well, increasing its share of Western Europe's paper and board from 26% to 28%.

Scandinavia retained its world paper and board share at 8%, and its pulp share at 13%.

There was little change in Australasia's position – its pulp share increased marginally from 1.4% to 1.5%, and its paper and board share decreased marginally from 1.3% to 1.1%.

Africa's pulp share increased from 1.2% to 1.5%, and its paper and board share from 1% to 1.2%. South Africa accounted for 80% of Africa's pulp and 69% of Africa's paper and board in 1992.

The following table illustrates the standing of the top 25 pulp, paper and board producers in 1992:

Table 1: International standing in pulp, paper and board production 1992

Paper and Board production		**Pulp production**	
Country	1000s tons	Country	1000s tons
1. USA	74,729	USA	59,282
2. Japan	28,322	Canada	22,841
3. China, P.R	17,251	China, P.R.	11,985
4. Canada	16,594	Japan	11,200
5. Germany, FR.	12,930	Sweden	9,589
6. Finland	9,147	Finland	8,525
7. Sweden	8,378	CIS	6,800
8. France	7,697	Brazil	5,368
9. CIS	6,050	France	2,609
10. Italy	5,961	South Africa	2,320
11. Korea,Rep.	5,504	Germany	2,240
12. United King.	5,128	Norway	2,009
13. Brazil	4,915	Chile	1,681
14. Taiwan	3,977	Portugal	1,592
15. Spain	3,448	Spain	1,530
16. Austria	3,252	Austria	1,489
17. Netherlands	2,835	India	1,400
18. Mexico	2,825	New Zealand	1,288
19. India	2,540	Australia	982
20. Indonesia	2,263	Indonesia	821
21. Australia	2,072	Poland	650
22. South Africa	1,814	Argentina	629
23. Norway	1,684	Mexico	560
24. Switzerland	1,305	United Kingdom	545
25. Thailand	1,245	Italy	511

In terms of *company*[6] performance, the USA remains dominant. In 1992, six of the top ten companies were American. Of the top fifty companies, nineteen were American, while seven were Japanese, four Swedish, four Finnish, three Canadian and two German.

Of the top 150 companies in 1992, each geographical region's share is listed below:

North America:	42
Europe:	61
Asia:	31
Latin America:	10
Oceania	5
Africa:	1

3.2 South Africa's relative position in the international production, consumption, and trade of pulp, paper and board[7]

Production

In terms of output, South Africa is a relatively significant player in the international pulp, paper and board industries. In 1992 South Africa was the 10th largest producer of pulp, and 22nd largest producer of paper and board in the world. South Africa's absolute share of international production is, however, small. In 1992, we produced 1.4% of the world's pulp, and 0.7% of the world's paper and board.

Consumption

South Africa ranks 22 in terms of overall consumption of paper and board, although in per capita terms, this ranking plummets to 42. Paper consumption is measured in terms of kilograms of paper per person per annum. At 38.9 kg. per capita per annum, South Africans are way behind the top twenty consuming countries, (who averaged 192.3 kg per capita in 1992), and below the world average of 45.3 kg.[8]

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[6]Company data are sourced from *Pulp and Paper International* September 1993. Company ranking is according to gross sales, unless otherwise indicated.

[7]All information on production, consumption, trade, market share and company performance is drawn from *The Pulp and Paper International Fact and Price Book* 1992, or the July 1992 or September 1992 editions of *Pulp and Paper International*. All published by Miller Freeman Inc. Brussels and New York.

[8]In this respect we fall far below the consumption rate of many developing countries, including Malaysia (60.8 kg p.c.); Costa Rica (53.9 kg p.c.); United Arab Emirates (49.1 kg p.c); Panama (48.2 kg p.c.) and Chile (40.1 kg. p.c).

Exports and imports

South African pulp, paper and board exports grew dramatically during the 1980s, but still account for a small proportion of international trade. Between 1981 and 1990 our pulp exports rose by 43% and our paper and board exports rose by a massive 183%. By 1990 South Africa was the 12th largest exporter of pulp, and the 20th largest exporter of paper and board in the world (This is an improvement from no. 11 in pulp exports and no. 23 in paper and board exports in 1981). However, our absolute share of international export volumes are small. In 1990, our export share was 2% of all pulp exports, and 0.9% of all paper and board exports.

Although our exports grew in absolute terms in the 1980s, world exports also grew steadily, and as a result, our share of world pulp exports increased by only 0.2% and our share of world paper and board exports by 0.5% between 1981 and 1989.

In certain pulp and paper grades, South Africa's exports are more significant than our ranking would suggest. For example, South Africa produces 15% of the world's dissolving pulp, a woodpulp material used to produce rayon, viscose and non-woven textiles.

South Africa is an insignificant importer of pulp, paper and board. In 1990 South Africa accounted for less than 0.5% of world pulp, world paper and board imports. We therefore have a significant trade surplus on the international market.

Company size

In terms of company size, only one South African firm, Sappi Limited, ranks among the world's top 150.[9] Based on 1992 results, Sappi is placed at number 35 when ranking is measured according to gross sales. In terms of earnings, however, Sappi's ranking improves — Sappi was the 20th most profitable pulp and paper company in the world in 1992 (PPI September 1993).

Understanding South Africa's international position: a small but significant player

An important factor in understanding South Africa's relative international position is that the international industry is dominated by a few countries. In 1992 the top three pulp producing countries together produced 57% of the world's pulp. The top five together produced 70%, and the top ten 86% of the world's pulp. In paper and board, the top three produced 49%,

[9]Mondi is not listed among the top 150 companies, but this is not necessarily because it does not warrant a place. Mondi is not a listed company, and therefore its results are not published. If Mondi results were published, the Company would probably find a place among the top 150.

the top five 60%, and the top ten 76% of world paper and board.

In company terms, world production and sales are also dominated by a few firms. In 1992, the top ten companies produced 23% of the pulp, and 27% of the paper and board produced by the top 150 companies. The top ten accounted for 33% of total international sales and 30% of total earnings.

South Africa's position then, is not among the dominant producers, consumers or exporters in the world pulp and paper industry. Our companies are not among the giants that dominate the international scene. However, South African companies have carved out a significant niche in the international market. South Africa ranks strongly among the 'second order' countries – smaller producers, which nevertheless play a significant part in the big picture.

3.3 Boom and Bust: the "golden days" of the 1980s, and the 1990 crash

The pulp and paper industry, like many commodity industries, experiences an established boom and bust cycle, brought about by a giddy relationship between supply and demand. When supply is short, and demand is high, prices are obviously pushed up. Companies respond to high prices and buoyant demand by investing in new capacity. However, since pulp and paper are most efficiently produced by large volume machines, the addition of a few new paper mills adds significantly to the level of supply. As new, larger machines come on stream and add new capacity, they raise the international level of supply.

Demand for paper is closely linked to the level of economic activity. A growing economy has historically meant growing demand for paper and paper products. If the creation of new pulp and paper capacity co-incides with strong economic growth, the market is able to absorb new capacity, and companies remain profitable. If, however, new capacity comes on stream when demand is slipping, an oversupply situation develops, and prices come tumbling down.

Since it takes up to two years to construct a new paper mill, it is not uncommon for companies to find their new capacity coming on stream when demand has already dropped.

While the length and severity of cyclical downswings have differed over the years, the basic boom and bust pattern has remained the same. This situation leads to volatile prices and profit levels in the international industry.

The 1980s have been no exception to this pattern. The story of the pulp, paper and board industry in the 1980s is a classic tale of boom and bust. The period 1983 to 1989 was a time of enormous growth and prosperity for the international pulp and paper industry. Production, capacity and consumption all grew at an unprecedented rate. The 1980s saw an *increase* in

consumption of 64 million tons – 30% higher than the increase in the 1970s, and 1 million tons higher than the total world consumption in 1958!

Demand for paper boomed during this period, and the industry experienced high profitability. As a result, large investments were made all over the world, particularly in the second half of the 1980s. The international industry was hit by an extraordinary wave of acquisitions and new capital investment. Because of the growing size of paper machines, the addition of a single machine or mill in the commodity grades added significantly to international capacity. In 1989 alone, new investment added almost 10% to international paper and board capacity.

Between 1983 and 1988, production capacity grew at an average of 7.2% per annum, and output grew at an average of 4.8% per annum. The growth in both capacity and production, was supported by a virtual explosion in paper consumption which grew at a rate of 4.9% per annum. As a result, prices and profitability both remained high.

In 1989, however, paper consumption (along with the international economy), began to slow. Consumption growth slipped to 3% in 1989, and 2.1% in 1990. Production growth slowed down in response, growing at a rate of 2.8% in 1989, and 2% in 1990.

Growth in capacity, however, was speeding ahead like a runaway train. Although new capacity had been building up throughout the 1980s, substantial further investments had been made in 1989/90. Much of this new capacity come on stream at the end of the decade, just when consumption rates were falling. Capacity grew by 4% in 1989, and in 2.3% 1990. By the end of 1990, pulp capacity outstripped consumption by 12.5%, and paper and board capacity outstripped consumption by 11%. An overcapacity crisis had been created.

The trends in consumption and capacity are illustrated below:

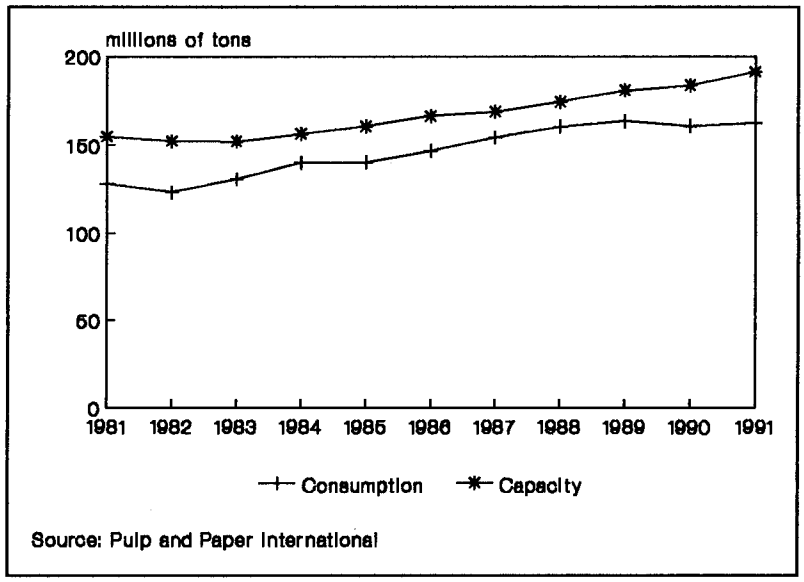


Figure 2 Pulp consumption and capacity 1981–1991

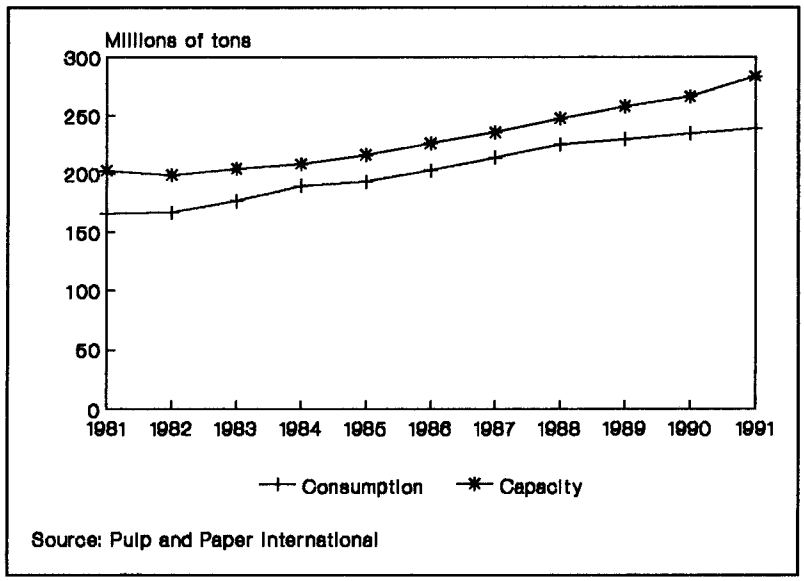


Figure 3 Paper and board consumption and capacity 1981–1991

The rise in capacity coupled with the drop in demand resulted in a steep slide in prices. The price decline started in mid-1989 and continued through 1990, 1991 and 1992 and 1993. 1994 is not expected to see major price improvements, but this will depend on growth in the world economy.

Since the mid-1989 high, pulp prices have fallen by an average of 40%, kraft paper prices by 20%, newsprint prices by 25%, and fine papers prices by between 15% and 20%.

From early 1990, then, pulp and paper companies suddenly found themselves in trouble. Prices were dropping fast, while the spending spree on new capacity and acquisitions left many heavily in debt. The 'seven good years' in the industry had come to a sudden end.

Acquisition activity came to an abrupt halt for many companies in the early 1990s, as the debts generated by previous acquisitions began to take their toll. Whereas in the late 1980s, "the corporate sharks were circling their prey and getting ready for the kill, it now looks like some of the biggest names in the industry are bloated by the feeding frenzy of the past few years. Debt-to-equity ratio's for several companies are alarmingly high" (Matussek and Pearson 1991).

For most paper companies, the crisis manifested itself in a declining sales and profits. Whereas the profits of the top 150 companies had grown by 35% in 1987, and 26% in 1988, growth in profits slowed to 2.7% in 1989. Profits then dropped by 18% in 1990, and continued to slide in 1991 and 1992. At the same time, the average assets of the top 150 companies had increased as a result of the wave of acquisitions, and this compounded companies' problems. Trends in the sales, profits and assets of the top 150 are illustrated on the following page.

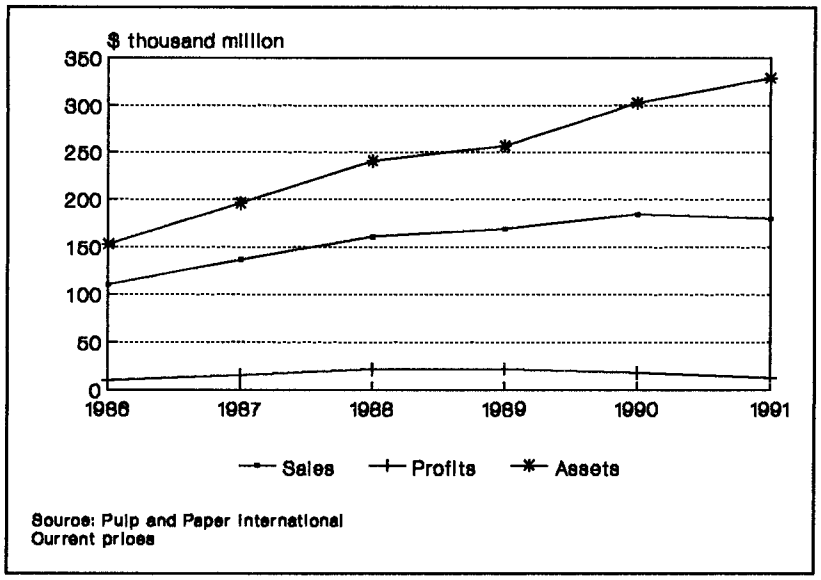


Figure 4 Sales, assets and profits of the top 150 companies 1981–1992

As a result of the price crisis, new capital investment projects have slowed dramatically since 1990 and many planned projects have been cancelled. 1990 saw the lowest level of capital investment since 1986, with new pulp investment dropping 22% and new paper and board investments dropping 18%. Recent estimates of capacity increases in the United states – the world's largest producer – project that between 1993 and 1995, pulp capacity will increase by only 0.6% and paper and board capacity by 1.7%. Growth in pulp capacity will be the lowest in 25 years (Pulp and Paper Project Report, December 1992).

Acquisition activity has also slowed to a virtual standstill. Sappi's acquisition of Hannover Papier was one of the only major acquisitions in the international industry in 1990. Merger activity has, however, continued, as companies merge in order to cut costs (Abrahams 1992a).

Many companies are now selling their products at marginal rates. For example, while North American and Scandinavian producers were making a 55% profit margin on pulp in 1989, their production costs are now around 5% below the world price (Kennedy 1992).

Some countries have been hit worse than others. The high-cost Finnish and Swedish industries have reported huge losses. Swedish firms experienced a collective loss of around 250 million U.S. dollars in 1992, and Finnish industry losses were of a similar order. The Swedes have been forced to cut 200 000 jobs (30% of industry employment) in the last three years (Abrahams 1992a). Shut-downs and retrenchments in the industry are "as common as fleas on a junk-yard dog" (Matussek and Pearson 1992). The Scandinavians, and particularly the Swedes, were assisted by dramatic currency devaluations in late 1992. These lifted pulp

and paper exports in 1993, but also caused fears of rising inflation. Depreciation is not likely to provide a long-term panacea to the Scandinavian pulp and paper industry's problems.

Canada has been very badly hit by the downturn, partly as a result of inefficient production and old technology. Canada's West Coast producers alone chalked up collective losses of 1400 million Canadian dollars in 1991 and 1992 (Simon 1992). The former USSR also suffered heavily. Since the collapse of the Soviet state, there has been a sharp drop in paper consumption, and the industry has declined steadily since then.

The international tendency towards over-investment and overcapacity was particularly evident in Japan, due to the cheap capital offered by the booming stockmarket in the second half of the 1980s. According to Japan's Ministry of Trade and Industry, paper making capacity increased by 76% between 1982 and 1991.[10] Japanese company profits fell by an average of 50% in 1991, and many fell further in 1992.

The United States, the world's largest pulp and paper producer has suffered from low prices and overcapacity, but the industry has been showing signs of "a patchy recovery" (Simon 1992) since late 1992. This was partly a result of the weak U.S. dollar, which allowed North American producers to export aggressively into the European market in late 1992.

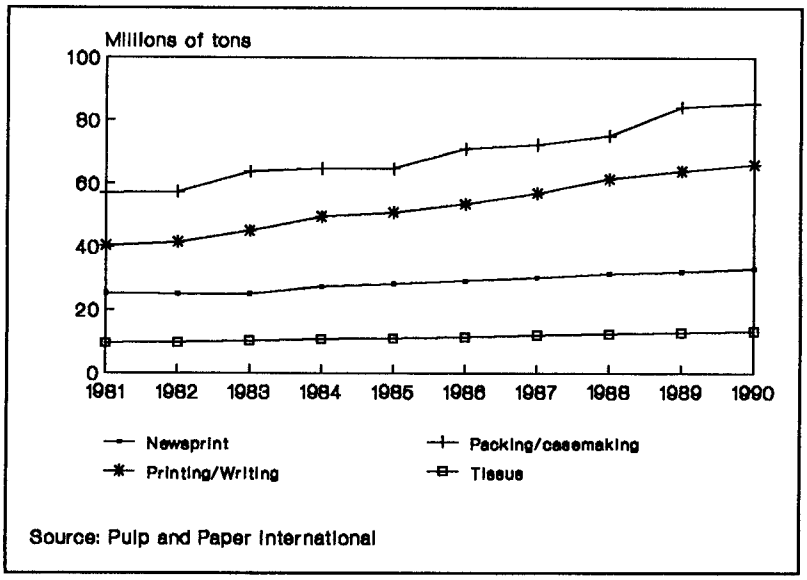
The weak dollar was not good news for everyone, however. The dollar's weakness, along with the turmoil in the European currency markets in the second half of 1992, created further havoc for Europe's pulp and paper producers, who were already beleaguered by overcapacity.

South Africa was also badly affected by the general crisis in the industry, and by currency changes. Sappi's net income dropped by 38% in 1991, and a further 16.5% in 1992. Sappi's Eugene van As has referred to 1991 as "one of the most difficult years of the century for the pulp and paper industry. It has seen the sharpest declines in some of the product prices since the Second World War, and has inflicted losses of an unprecedented proportion on many companies" (Sappi 1992). Mondi's net earnings were down 12% in 1991, and dropped a further 54% in 1992.

Which grades fared best? Production and consumption by pulp and paper grade

Paper is not an homogenous product — it is comprised of many different grades. Some grades of paper have survived the crash better than others as a result of differential levels of production and demand. During the 1980s, printing and writing papers grew most rapidly, and packaging papers also showed a steady growth rate. Demand for various paper grades is illustrated on the following page:

[10] *The Economist* 25 July 1992.



World paper and board consumption by major grades

3.4 Recent changes to the way that paper is made and sold

The last ten years have seen a number of important changes in the way that paper is made and sold, and in the way that paper companies operate. These changes have their roots in a range of pressures that have shaped and moulded the industry. The rate of change, has however, increased with the recent price crisis, as companies struggle to find new solutions to pressing problems. Many of the long terms trends described below, therefore, have been intensified by the industry's recent problems.

The impact of the southern producers

As noted in the introduction to this study, producers of pulp, paper and board who have access to fast-growing timber are at a significant advantage. These producers are mostly found in the southern hemisphere. Parts of the Southern USA, and the Iberian Peninsula, however, share these advantages.

Low pulpwood costs result from a number of factors. The primary factor is the speed at which trees grow. In the industry, this factor is measured as the 'Mean Annual Increment' — the number of cubic metres which a tree grows each year. Speed of growth relies on a number of factors, including climatic temperature, rainfall and tree type. Hardwoods such as Eucalyptus trees, are ready for harvesting in *7—10 years* in the fast-growing areas, as opposed to *60 years* in slow growing areas. Softwoods, such as Pine trees, are ready in *18—20 years* in fast-growing areas, as opposed to *80 years* in slow-growing areas. Other factors which determine wood price are land and labour costs, and whether the forest is

natural 'old-growth' forest, or an intensively managed commercial forest. Intensively managed forests have several advantages: they are less damaging to the environment as they do not threaten ancient forests, and they use high-yield genetically selected plants (Hagler 1992).

In the past, there was some concern over the quality of wood fibre generated by fast-growing trees. Fast-growing fibres are shorter than their slow-growing counterparts. This is particularly so for softwood species. Certain paper grades require longer fibres, and therefore, northern pulp is preferred. For the majority of paper grades, however, technological advances have ensured that shorter fibres are adequate. For certain paper grades, northern fibres are either used alone, or are added to the raw material furnish. For this reason, northern softwood fibres will continue to command a certain section of the market. In terms of overall demand, however, fibre length is not considered an impediment to the growth of southern pulp and paper in the international market.

Indeed, producers from low wood-cost areas are growing in significance in the international industry. At present, southern hemisphere producers produce 7.2% of the world's total pulp production, and 6.5% of the world's paper and board production. These proportions are relatively small, but they are growing fast. Between 1969 and 1989, the production of market pulp[11] in Brazil, Chile, New Zealand, Australia and the Iberian Peninsula almost doubled to comprise 7% of total world production (Hagler 1992). Latin America alone is expected to produce almost half of the increase in pulp production by the end of the century. By the year 2005, Latin America is expected to account for 30% of international trade in pulp, paper and board (Crawford 1992).

In addition to existing commercial forestry in the southern hemisphere, there is enormous potential for expansion of plantation forests in Indonesia, and in West and Central Africa. Indonesia has 144 million hectares of natural forest. It is estimated that if just 5% of the forest area was converted to plantation forest, Indonesia would have the potential to supply one third of the world's pulp demand. While Indonesia's progress has been slow up to now (only 326000 hectares of forests have been converted to plantation), capital is available in the country to make the necessary investments. A number of pulp projects are in the pipeline. In the long term, Indonesia may be as competitive as Brazil (Keeling 1992).

Central and West Africa also have enormous potential, due to large forest resources and favourable climatic conditions. However, major investment is unlikely, due to a lack of capital and ongoing economic and infrastructural problems.

[11]Market pulp is pulp which is sold on the market, rather than being converted into paper immediately in an integrated pulp and paper mill.

In the medium and long term, then, the importance of the low-cost southern producers will grow. As a result, high-cost northern producers will be hard pressed to compete in commodities such as pulp, newsprint and packaging paper. This will mean that high-cost producers will be forced to cut costs through greater manufacturing efficiency, and to concentrate on higher-value, non-commodity markets.

Environmental pressures

Over the last decade, the industry has faced a wide variety of environmental pressures, particularly in North America and Europe. These have impacted significantly on the way that paper is made and sold. Environmental pressures have affected the industry in a number of ways.

The first set of pressures impact on various forms of forestry, and have implications for raw material supply to pulp and paper producers. The last decade has seen the intensification of international concerns about deforestation. Currently, about 11 million hectares of tropical forest are lost each year, mostly through land clearing and fuelwood collection in developing countries. In 1990, pulp and paper accounted for 17% of world wood consumption, whereas fuelwood consumption accounted for 52% (Wilson 1991). The vast majority of pulp producers today, use wood from managed forest sources. Managed forests however, often compromise biological diversity and threaten unique habitats. This has become a source of concern in many countries. There is enormous pressure in various parts of the world, not only to prevent tropical deforestation, but also to stop logging of 'old growth' forests which provide a unique habitat to endangered species. One example of this is a recent USA government decision to protect the habitat of the endangered Spotted Owl. This decision prevents logging in 11.6 million hectares in the Pacific northwest. The decision has had a major influence on timber prices – the price of delivered softwood chips in that region has increased by 80% (Hagler 1992).

Similar decisions have been made throughout the world. In Thailand, the Government recently suspended permission for large-scale eucalyptus plantations after a pulp company was found cutting down a section of national forest reserve, in order to make way for eucalyptus plantations (ILO 1992). The Swedish Government has committed itself to protecting biodiversity, under the Second World Conservation Strategy. Researchers estimate that up to 15% of Sweden's productive forest lands will have to be protected to reach that goal (ILO 1992).

These pressures will, according to international wood analyst Robert Hagler, also push the industry towards reliance on intensively managed commercial forests. These are plantation forests, dedicated to commercial production of wood, which do not threaten natural, old growth areas.

The second major area of environmental concern is the process of manufacturing pulp, paper and board. The manufacturing process causes various dangers to the environment.[12]

The first problem concerns pollution of the waterways through the release of effluent. Pulp and paper mill effluent is dangerous to the environment in the following ways:

- Effluent may be high in Biochemical Oxygen Demand (BOD) as a result of containing decomposing material. When a large amount of material decomposes quickly in a waterway, it consumes large amounts of oxygen. If the BOD is too high, fish and plant organisms will be starved of oxygen, and may die.

- Effluent may also be high Chemical Oxygen Demand (COD) as a result of containing slowly decomposing material. This increases the amount of oxygen needed to oxidate effluent impurities, and can also impact on the oxygen supply in a waterway.

- Effluent may contain suspended solids and certain nutrients (such as phosphorus and nitrogen), which also impact on oxygen levels in a waterway, and which may carry poisonous substances.

- Effluent may contain toxic substances, in particular, organic chlorine compounds. These compounds, such as chlorine dioxide, are highly toxic and cannot be filtered out. One gram can take up to 100 years to degrade, and some chlorine toxins are considered carcinogenic. These substances are thought to harm plant, marine and animal life, and also may affect humans through the food chain. The amount of organically bound chlorine in effluent is measured through a parameter known as Absorbable Organic Halogens (AOX). AOX levels are high in mills where chlorine is used in the bleaching process.

As a result of extensive negative publicity regarding the presence of chlorine in pulp mill effluent, and in paper products, there has been a move towards producing chlorine free pulp. The movement towards chlorine free bleaching originally came about in the mid-80s, as a result of environmental and health concerns regarding the presence of chlorine in mill effluent and in paper products.

The first stage of this development has seen the production of pulp which is free of elemental chlorine, but still makes use of organic chlorine. Elemental Chlorine Free (ECF) processes are well established, and have been in use in some mills for many years. One form of ECF bleaching, which makes use of oxygen as a bleaching agent, was co-invented in South Africa by Sappi in 1978. At that stage, however it was used "for reasons which had

[12]Information and definitions with regard to water and air pollution is from the International Labour Organisation 1992:19-21.

nothing to do with environmental pressure. We were unwittingly leading the world in environmentally-friendly bleaching" (Interview, Johannesburg, 1992).

ECF pulp, however, still contains chlorine compounds, and has not been accepted as a solution to the chlorine bleaching problem. In the late '80s, amid growing environmental and consumer concern, German retailers (notably Tengelmann), refused to sell certain paper products (such as tissue) unless the pulp which was used in production was *totally* free of chlorine. This forced pulp producers to find ways of bleaching pulp, without the use of either elemental or organic chlorine. The market for Totally Chlorine Free (TCF) pulp, has grown, as consumers demand a range of products which are totally chlorine free. Such products include baby diapers and high quality printing and writing papers.

There are certain difficulties associated with producing pulp (and therefore paper), which is sufficiently bright (and white), without the use of some form of chlorine. At present, sufficient levels of brightness can be achieved using the sulphite pulping method, but this method produces pulp with lower strength properties, than pulp produced by the sulphate (kraft) method. Recent advances have been made in lifting the brightness of sulphate pulp by substituting ozone and other alternative bleaching agents for chlorine. Further technological breakthroughs are needed, however, before higher levels of brightness are possible.

Many scientists and even some environmental groups believe that the traces of chlorine in ECF pulp are too small to be harmful to consumers or the environment. Despite this, there are two forces which suggest that TCF pulp will not only survive, but will become the standard pulp internationally. The first is that there is a strong consumer demand for TCF products, particularly in Germany. Whether consumers are scientifically correct or not, is perhaps, besides the point. The Confederation of European Paper Industries (CEPI) sums up this situation as follows:

"The fact is, that the industry is moving strongly to produce TCF pulps with sufficient brightness, adequate strength, and at a price consumers will pay. The chlorine issue is largely over, at least in Germany. What can we learn from this unfortunate series of events? I say unfortunate, because from a scientific point of view there is no proof that we must totally remove chlorine from our bleach plants. *But the market thinks we must, and is telling us we must, so we must.* And that is what we can learn" (Clark 1992).

The second factor encouraging TCF bleaching concerns the production related advantages of TCF production. We have noted that sulphate pulp cannot be produced to full brightness without chlorine, at present. But the presence of chlorine is costly, because it prevents the re-use of water used in the bleach plant. The presence of chlorine makes the water corrosive, and if re-used, the water would corrode and damage the pulp-plant equipment. As a result, water used in bleaching cannot be re-used and must be released as effluent. This represents a significant cost to the producer. If and when a TCF bleaching method is developed for sulphate production, it will be possible to 'close' the production process, thus making the

water used in the bleaching process available for re-use. This would represent a significant cost saving to pulp producers, as well as reducing effluent released into the environment.

It is unclear whether TCF will become the international standard, or whether it will continue to exist as one among many pulp grades. Some industry analysts argue that "the tide will sweep the market pulp industry towards the final elimination of chlorine from its bleacheries . . . a failure to respond to the rising environmental tide could lead to an ebb in companies' fortunes" (Pearson 1992). Others argue that public opinion will soften, and that TCF pulp will continue to be in demand in only a segment of the market.

The second major environmental resulting danger from the pulp and paper manufacturing process is air pollution. The main problem is the release of sulphur dioxides into the air through mill emissions. These substances result from energy production at the mills, and from the pulp production process itself. When sulphur dioxides collect in the atmosphere, they contribute to acid rain.

Water and air pollution have led to enormous pressure on pulp and paper companies. In some countries, companies have spent large sums of money to reduce environmentally damaging elements from their effluent and emissions. Environmental improvements accounted for 33.5% of capital spending by Canadian companies, and 13.8% of capital spending by American companies in 1991 (Pulp and paper Project Report January 1993). Environmental spending has been also been high in Scandinavia – the Swedish industry spent around $4 billion on environmental improvements between 1987 and 1992 (Abrahams 1992).

A third major source of environmental pressure, is the solid waste disposal problem, which is particularly prevalent in Europe. Solid waste disposal has been an important public issue over the last decade, due to severe shortages of landfill sites, and increasing public awareness of the environmental problems associated with landfills. This has led to a greater emphasis on recycling of household, municipal and industrial waste. In some countries the demand for recycling has been translated into legislation. Germany has the most advanced system in Europe, but many other countries, including Sweden, Denmark, France, Belgium and the Netherlands, are beginning to follow suit. The German *Packaging Ordinance* places responsibility for the collection and recycling of paper packaging with the manufacturer of that packaging. The manufacturer must therefore collect and recycle a given proportion of the packaging which s/he manufactures. The system is financed partly through the Green Dot system, whereby consumers pay a deposit on selected paper packaging. As a result of the legislation, Germany has high levels of paper waste recovery and recycling. By the end of 1992, 90% of packaging paper and 70% of newsprint manufactured in the country was being recovered (Grant 1993).

Internationally, the amount of paper which is recycled annually has increased from 60m tons in 1985, to 84m tons in 1990. It is forecast to rise to 150m tons by the year 2000 (Thornhill

1992). "The fastest growing forests," says Mr Jan Remrod of the Swedish Pulp and Paper Association, " are (the waste paper stockpiles) in the cities of Europe" (Abrahams 1992).

The increase in recycling impacts on paper manufacturers in a number of ways. It costs companies money to recover and recycle waste, and this only partly recoverable through the re-use of recycled fibre. Recycling also reduces the amount of 'virgin' fibre needed for paper manufacture. While this is good news for the environment, it is bad news for pulp producers. Demand for virgin pulp has taken a knock, as recycled fibre provides more and more of the raw material requirements for the paper industry. Although there are limits to the extent to which recycled material can be used in production, there is still some way to go, and pulp demand will come under pressure from this source. Industry analysts believe that by 2010, pulpwood will provide as little as 50% of world fibre demand. It currently provides about 60%.

But the Packaging Ordinance and similar pieces of legislation do not only aim to reduce waste through recycling. They aim to reduce waste at source. That ultimately means reducing per capita consumption in the developed countries. The spirit which guides German legislators, is captured in the following slogan:

"AVOIDANCE is better than QUANTITY REDUCTION which is better than RECYCLING, which is better than DUMPING" (Grant 1993).

Avoidance of, or reduction in the volume of paper packaging may slow the rate of growth of paper consumption. In the past, growth in paper consumption has been closely linked to growth in GDP. However, quantity reduction coupled with recycling may mean that in the future, paper consumption will not grow according to traditional patterns. A growing economy will not necessarily lead to a concomitant growth in paper consumption.

Concentration, globalisation and forward integration

The 1980s has witnessed a trend towards concentration. Modern paper production requires enormous economies of scale, and huge investments. Markets are increasingly global, and this too provides impetus to concentration. There are two major effects of concentration. Firstly, large mills account for more and more of world production. The largest 10% of mills in the European Community now account for 45% of production (ILO 1992). Secondly, the number of pulp and paper companies is decreasing as mergers and acquisitions produce a few giants in most pulp and paper producing countries. In the United states, 20% of pulp, paper and board companies disappeared between 1975 and 1989. In the EC, 22% of paper and board mills disappeared between 1980 and 1989 (ILO 1992).

This increasing concentration is associated with the globalisation of companies. In order to grow through acquisition, and in order to secure market access, companies are buying foreign mills and firms. What we see emerging therefore, are ever-larger and more global pulp, paper and board companies.

There is also a tendency for companies to integrate forward into paper products such as packaging. Such products are value-added goods, and much less vulnerable to cyclical price movements. However, consumer products such as packaging also demand a close proximity and responsiveness to the market. As a result, forward integration has occurred into the large consumer centres. A number of Swedish companies, for example, have acquired packaging companies inside Western Europe – the biggest market for Swedish products.

Product differentiation and niche marketing

One response to the downturn has been greater product differentiation, aimed at capturing niche markets. In the past, paper companies have concentrated on volume, often at the expense of value. Pulp and Paper International's John Pearson believes that in the late 1980s, "too much money was spent on merely growing big. Too little went into achieving a real advantage for companies. In effect, many companies were just buying the capacity to make even more standard, undifferentiated, low-value products. They were not protecting themselves from the next cyclical downturn by adding value to their product lines and services". Pearson also argues that too many companies are investing "in big machines for low-growth markets – swamping the market with new capacity" (Pearson 1991).

Companies now find themselves under pressure to produce new or differentiated products for smaller markets. Some companies are already doing so – SCA and Stora, two of Sweden's largest firms have moved away from commodities like pulp, and towards differentiated products like printing and writing papers, and specialities (Abrahams 1992). However, even niche markets and specialities have not been completely safe havens. As Paul Abrahams of the Financial Mail puts it "Paper companies have an unfortunate herd-like instinct, which means that once one group has identified a fast-growing niche area, most of the rest plough in, leading to massive overcapacity and commodity-style prices" (Abrahams 1992).

Greater consumer orientation

Another result of increased competition is a change in the relative importance of customer service, and particularly an increase in the speed of delivery times. For many companies this has meant that to compete successfully in the consumer grades (eg. printing and writing papers, as opposed to market pulp), they have been forced to move to production facilities closer to the end market. The delivery time and service required to supply medium scale printers, for example, means that a great distance between the mill and the customer becomes unfeasible. This has led to a tendency for firms located some distance from consumer markets to make acquisitions in the heart of the consumer markets.

The trend towards greater customer service is emerging as an important element of success in the current conditions. As Mr B. Lof of the Swedish firm Modo puts it: "The people that will suffer are those who have not realised that the pulp and paper industry is no longer

solely a production oriented industry. It has to be a marketing industry too" (Quoted in Thornhill 1991).

Achieving efficiency and quality

Companies are increasingly forced to cut costs and try ensure the continued loyalty of their regular customers. In order to sell their products in a tight market, companies must increase their efficiency, as well as improving their quality.

One way to increase efficiency is to improve economies of scale. Over the last decade, the output of new paper machines has become greater and greater. Paper machines have become wider, so that they produce bigger reels of paper without additional labour, and with little additional energy. When such machines are used to produce only one or two grades of paper, efficiency is very high, because there is little or no downtime. Modern machines are also capable of reaching high speeds, so that more paper is produced more quickly. In most grades of paper, old, slow, narrow machines, which change grades regularly, can no longer compete with the new technology. Some value-added printing and writing grades are still efficiently produced on narrow machines with high degrees of flexibility. For most producers, however, efficiencies of scale cannot be ignored.

As a result of rising efficiencies of scale, and for other reasons which are discussed below, the volume of output per employee has been rising steadily over the last decade. This trend is particularly noticeable in Europe. In the European community between 1980 and 1989, 125 000 jobs were lost in the pulp, paper and board industry, despite massive growth in output. Employment in the paper industry in the European Community dropped by 2.6% per annum in the 1980s, and 0.66% per annum in the USA between 1978 and 1990.

This productivity growth can be attributed to both incremental improvements, and the replacement of old, labour-intensive mills with new, less labour-demanding mills.

There are some signs that the level of productivity improvement is levelling off, and that employment levels per ton are beginning to steady. A recent European Commission study predicts that job losses in the sector will slow down in the 1990s (ILO 1992). It is unclear, however, whether this will indeed be the case. The scenario will be influenced by a variety of factors, including demand for products and further technological change.

The ILO points out that employment loss can also be influenced by choices made by the various parties. One example of this is reducing job loss by shortening the length of the working day. The ILO argues that "the process of employment adjustment can and will be influenced in a number of ways by the social partners in the sector and the government. This will concern the modalities, such as finding socially acceptable ways of dealing with redundancy and coping with technological change . . . It may be expected that the trade-off between job security on the plant floor and work flexibility will be the major collective bargaining issue for the 1990s" (ILO 1992).

In the 1980s and early '90s, however, manufacturers have become concerned with the quality of output, as well as the quantity. This has led to a blossoming of quality systems and procedures. These are described below.

ISO 9000 and Total Quality Management

The 1980s, and the late '80s in particular, have brought the industry under increasing pressure to meet quality requirements. Quality has long been a concern, and a marketing tool, but with the recent industry malaise, pressure on quality has intensified. As Mr Dermot Smurfit, Chief Executive Officer of one of the world's largest paper companies puts it: "On quality, the basic proposition in the future will be that a pulp, a paper or a package, performs the first time every time, and this will be a prerequisite for doing business" (Thornhill 1991).

This emphasis on quality is evident in two developments in the industry — the move to ISO 9000 certification (an international system of quality accreditation), and the growing popularity of the concept of Total Quality Management (TQM). As Pulp and Paper International puts it: "Systems for obtaining total quality — not to mention certificates for proving such an achievement — have never been so popular" (Marcus 1992).

The pressure for greater quality, and for certificates that provide quality assurance, is said to have started in the packaging segment of the industry. Manufacturers of paper packaging found that some customers, Japanese electronics firms in particular, demanded conformance to quality standards (Hendry 1993). This meant that packaging companies, and their raw material suppliers had to provide some proof of quality systems. This led paper companies to seek accreditation under ISO 9000, which had previously been limited to the engineering and defense industries.

ISO 9000, and other similar systems, are now common within the international industry. ISO 9000 is a system which aims to ensure that a given mill produces a product which displays a consistent quality. ISO sets specifications not only for the qualities of the paper — the end product — but for the production process itself. In order to gain certification, a mill must formalise the procedures within the production process, so that they are uniform and predictable, and do not vary with different shifts and workers. In this way the production process becomes consistent, and the product becomes consistent too. ISO does not aim to ensure that the quality of the paper is higher, but rather, it is a measure of consistent quality. It aims to ensure that a product or service is able to satisfy a given need. The process is audited externally and is widely recognised by consumers as an indication of quality production.

But ISO 9000 has its limits. "ISO 9000 is not a guarantee of quality," says Swedish firm Stora. "Quality is customer satisfaction. ISO 9000 certification does not eliminate problems, but it provides a tool for working with them" (Hendry 1992).

What *does* guarantee quality, according to some managers, is the process of Total Quality Management (TQM). Ian Hendry explains: "The TQM ideas, which, were gestated by people such as Deming and Juran during the Second World War, died out in post-war USA, where output and profit became the ideals. The Japanese, however, who needed to rebuild their shattered economy, saw quality as a marketing tool which could turn them from producers of 'copy-cat' products, into world leaders. They imported Deming and Juran to help them achieve their goal. The results are there for everyone to see" (Hendry 1992).

Hendry distils Japanese total quality management philosophy into six main points:

- Make respect for humanity a management philosophy — involve everyone in the firm in decision making.
- Quality comes before short term profit.
- Customer orientation is preferable to producer orientation.
- Break down internal barriers by thinking of the next stage in the manufacturing process as your customer.
- Measure your progress with facts and figures, not opinions.
- Promote cross fertilization — "just because a worker is in another department does not mean he is stupid".

(Hendry 1992)

Japanese management techniques, and quality management in particular, have been practised for many years in industries like auto manufacture. But TQM is a relatively new phenomenon for the pulp and paper industry, possibly because of the nature of the labour process (Possible reasons for the late arrival of TQM in pulp and paper production are discussed in Appendix 1). Whatever the reasons, companies in the international industry are increasingly focusing on ways of eliminating inefficiencies in the production process.

As and International Labour Organisation report puts it:

"The successful adoption of new technology, high and consistent quality, the elimination of waste, and the mobilisation of productivity reserves . . . have focused attention on the human resources in the pulp and paper industry . . . it is the potential for adjustment and innovation embodied in the workforce that determines the future of a mill or company" (ILO 1992).

Reducing waste and increasing flexibility

Two of the main aims of quality management are to reduce waste, and increase flexibility.

Waste stems from various sources — a production process can waste raw material, machine time and human effort. The production process starts off with a given volume of available raw material, a given amount of available machine time, and a given supply of human labour power. All of these resources are costly, and must be used to maximum benefit in order for a plant to be competitive. High yield on raw material and capital equipment, and effective use of labour, are key to manufacturing efficiency.

Achieving these efficiencies in the production process is dependent on a range of factors. Among these are the extent of 'downtime' (time that the machine is not being used), the proportion of finished product which is defective and cannot be sold, and the skill and organisation of labour.

Achieving efficiency then, is about producing the highest possible volume of quality products, with a given supply of raw materials, machine time and labour.

One of the ways of achieving efficiency gains is to reduce machine downtime by anticipating when machines are likely to break down, and intervening before this happens. This is known as anticipatory maintenance. When a paper machine costs thousands of rand an hour to run, preventing unnecessary downtime is very important indeed. Anticipatory maintenance, however, requires a new approach to paper-making. Goretzki explains that "one of the time-honoured views of paper mill management used to be that papermakers make money and maintenance men create costs" (Goretzki 1992). This view is changing fast. Some mills, such as the Kaipola mill in Finland, are now integrating their production and maintenance teams, so that maintenance becomes an integral part of production. This also means that both maintenance and process workers must have a range of skills, and a wide understanding of paper-making technology.

A second trend in trying to achieve efficiency is the attempt to use labour more flexibly and more effectively. This has led to various changes in work organisation. Some of these changes increase efficiency through empowering workers, while others are more repressive.

One example of increased flexibility is in the employment of sub-contracted labour. Sub-contracting is an example of numerical flexibility, or flexibility in the size of the workforce. Sub-contracting is limited in this industry, but it is growing. Over the last decade, sub-contracting has increased in certain areas, notably forest harvesting, transport and some aspects of maintenance. The ILO takes the view that sub-contracting would be more prevalent if it were not resisted heavily by trade unions, particularly in the USA (ILO 1992). Sub-contracting does cut costs, as well as increasing flexibility. However, it has serious negative consequences for workers. Workers in sub-contracting firms typically earn much lower wages, are not unionised, suffer high accident rates and receive fewer social security

benefits (ILO 1992). In the case of sub-contracting then, flexibility and cost reductions take place at the expense of workers.

Another form of flexibility is multi-skilled team work. Teamwork can take the form of problem-solving project groups, or permanent work crews. Problem solving teams are a relatively common way of addressing specific difficulties which occur in the production process. These teams are usually multi-disciplinary, and exist only as long as the problem persists. Other managers have seen the more permanent potential for team work. In the Kaskinen mill in Finland, for example, machine operators are organised into permanent work teams. There is no hierarchy within the team, and no supervision. Workers are multi-skilled, and arrange their own work methods. Output at the mill has increased rapidly under this system (ILO 1992).

The above example is, perhaps, an example of working 'smarter' rather than working 'harder'. Working 'smarter' is about gains in output per employee, that are made via means other than workers simply intensifying their effort. Such gains may be achieved through a wide range of means, including multi-skilling, improved work organisation, better use of technology, more effective problem solving, and the reduction of waste and defective products.

But the dual pressure on companies — to cut costs and improve product quality — have led to various attempts to make workers work 'harder' as well as 'smarter'. Working 'harder' is about the intensification of work. This happens when fewer workers do more work just by virtue of intensifying their effort. This is also taking place in the industry, particularly in the less skilled parts of the labour process.

Practises which rely on workers permanently intensifying their work effort, may create problems in the longer term. If work is already stressful, intensification will carry a high human cost, and will be resisted. If the work carries high levels of responsibility, greater intensification may lead to costly errors. Excessive intensification then, is likely to prove unsustainable in the long term.

Training and skill formation

The quality focus is also associated with increasing concern about the levels of training in the industry. Countries and firms differ in the amount and type of training which they offer to workers. But levels of training and human resource development are now seen as key to the competitive advantages that some countries have over others. In the pulp and paper industry, Germany and Scandinavia probably have the most successful training systems, while North America, the UK and Latin America lag behind.

The difference between countries' training systems goes beyond the pulp and paper industry, and is linked to national approaches to training and development. Some argue that in the

United Kingdom and her ex-colonies, excellent academic education for a few may have stunted effective education and training for many. According to *The Economist*:

"Thanks to A-levels, the cost of producing University graduates has been cheaper in Britain than practically anywhere in the world . . . but (the country) has paid dearly by skimping on the way it prepares all the technicians and craftsmen needed by industry. The challenge today is how to provide training that the schools — in their pursuit of excellence for one out of seven pupils — failed to provide the other six . . . The lack of technical skills at the level of foremen is a very serious problem that the industry faces . . . to match Germany's performance, Britain would have to produce 80 0000 more qualified craftsmen every year" (*The Economist* November 1992).

North America and the United Kingdom have tended to produce too few technical staff, and have also relied on 'on-the-job' training, rather than formal training systems. This is becoming a serious problem for the pulp and paper industries of those countries, since they are competing with nations like Japan, Germany, Sweden and Finland, which have invested heavily in formal training programmes.

Pulp and paper industries in developing countries not only lack formal training systems, they also face inadequate secondary school education. As a result, their new recruits start off from a significantly lower base than their competitors in developed countries. Developing countries which inherited their education and training systems from Britain, have also inherited Britain's problems in this regard, and are perhaps worse off than other developing countries.[13]

Some developing countries, along with the United states, Canada and the United Kingdom are now beginning to change their approach to training, both at company and national level. Many have sought to imitate the best features of the of the Japanese, German and Scandinavian systems. Many new training systems now seek to emphasise the following features:

- More training for production (process) workers, rather than restricting training to engineering (maintenance) workers, and managers.
- Formal training that results in certification rather than on-the-job training.
- Training systems that begin in the final years of secondary school, rather than post-secondary school training only.

[13]South Africa is in a poor position with regards to training and skill levels. Not only did we inherit a British-style education system which under-values technical and vocational training, but apartheid education systematically denied educational opportunities to the vast majority of the population. The discussion of South Africa's education and training system will be continued in Chapter 4.

- Ongoing training offered throughout working life.

- Greater co-operation between companies, and greater co-ordination between governments, employers organisations and trade unions in the planning and implementation of training.

There is also a growing concern that jobs in the pulp and paper industries are unattractive to new entrants to the job market. One of the reasons for this is that the skills of process workers are not portable across industry sectors. In fact, at present they are often not even portable across companies. This problem not only discourages the best job seekers from entering the industry, it also makes employment in this sector insecure for those who already work in the industry. For these reasons the ILO advocates training and accreditation systems which allow vertical and horizontal flexibility within a mill, within the industry and across industrial sectors. The Organisation points out that this requires "the introduction of standards and accreditation of skill for as many employees and as many stages of a career as possible" (ILO 1992).

These aims have been achieved to some extent in certain countries. New British and Finnish schemes are based on modular learning, and lead to accreditation under the national vocational system. They emphasise multi-skilling, and a wide-ranging knowledge of the entire production process (ILO 1992). In Australia, the training system credits generic as well as specific skills, and this leads to much greater mobility within and across sectors.

In summary, the trends in training and skill formation indicate that in future, training will receive a high priority in the industry. The direction of world class training will be towards formal training systems, which allow for accreditation and mobility, and which are co-ordinated through the involvement of the national education authorities, the employer organisations and the trade unions.

3.5 A downturn or an about-turn? How fundamental is the current crisis?

Is the sad state of the world pulp and paper industry just another cyclical downturn? Some commentators in the industry do view the recent crisis as one in a long and well established cycle. The downturn in the paper industry is, they argue, the result of periodic economic downturn coupled with overcapacity. Demand will pick up as the economy improves internationally, and the market will correct the overcapacity.

However, there are others such as John Thornhill of the *Financial Times* who argue that "the latest downturn represents more than just a cyclical phenomenon, – the industry has reached an irrevocable threshold" (Thornhill 1991). Thornhill argues that there are a number of factors that have emerged since the late 1980s that change the framework in which the industry operates.

Many of the changes discussed in this chapter may become permanent features of the industry. In particular, the rise of the southern producers, the impact of environmental pressures, the increased scale of paper machines and the higher degree of customer service, seem to indicate permanent restructuring. These pressures, along with stagnating demand and a more competitive climate all point to a future which is not business-as-usual for the industry.

The downturns in the paper business cycle have become longer and deeper over the last two decades. This may convince the industry not to repeat the pattern of over-investment which leads to crippling overcapacity. If this occurs, the next upturn in the business cycle may not be as steep as it has been in previous cycles, and a greater levelling-off may be achieved. The Managing Director of one of Europe's largest companies recently suggested that "A mechanism be developed between the major pulp and paper producers, whereby investment in new capacity is effectively planned in a manner which will not result in violent increases in capacity at times of mediocre economic growth. At the same time, the rate at which new capacity is brought on stream should be managed to minimise violent market effects" (Kennedy 1992).

It remains to be seen whether the industry can achieve that level of co-operation, or whether the lessons of the current crisis will be forgotten when profitability returns to the industry. It does seem clear, however, that with or without greater industry co-operation, the 1990s will not reproduce the favourable conditions of the second half of the '80s. Some analysts expect pulp overcapacity to remain as high as 15% into the mid-1990s. And overcapacity in some paper grades could last until the late 1990s (Abrahams 1992).

Much will depend on the level of growth in the international economy. International paper consumption has been higher than economic growth for over a decade, and this trend is expected to continue, although at a lower level. This means that a 3% annual growth rate in the world economy over the next 15 years would generate approximately 3.5% annual growth in paper demand. This would be sufficient to return the industry to profitability, provided that additional capacity is contained.

Much of the world's economic growth is expected to come from the Far East, and paper demand is therefore, likely to grow quickly in that region.

Printing and writing papers, and packaging papers would be among the first to benefit from increased economic activity, and the demand outlook for those papers is good.

Prices will also be affected by changes in cost structures. More use of low-cost southern pulp and recycled fibre, along with rising levels of efficiency and productivity, will probably bring variable costs down for most grades. Fixed costs, however, are likely to rise, as a result of increasing investment in environmental protection, and the rising costs of greenfield mills.

Prices may also be affected by changes to the international trade regime. Various agreements, which are currently being negotiated, could lead to a general lowering of tariffs on paper imports. Import tariffs on paper range from 2.5% in the U.S.A. to 9% in the European Community, to 25% in Brazil (BTI 1992). Trade agreements are being negotiated in the European Community, Latin America, and North America. These, along with the Uruguay Round of the General Agreement on Trade and Tariffs (GATT), will probably lower average tariff levels, and create greater uniformity in tariff protection. If this does happen, increased trade, and increased competition will exercise downward pressures on paper prices.

Many companies believe that good profitability will return to the pulp and paper industry in the medium term. Before that occurs, however, the least efficient producers will be forced to close. And in the short term (the next two to three years) most companies will continue to battle with overcapacity and the increasingly sophisticated demands made by the market. The 'easy money' days of the late 1980s are probably gone forever.

Chapter 4: The South African Paper Sector

4A South African commercial forestry

4A.1 A brief history of forestry in South Africa

Anyone driving through the massive forests of the Eastern Transvaal or Natal could be forgiven for thinking that South Africa is naturally rich in afforestation. The fact is, however, that South Africa is almost devoid of natural forests. Aside from small areas of subtropical forest in the Eastern and Western Cape, there is no record of naturally occurring forest in the country. The vast majority of forests in South Africa today are commercial plantation forests which have been planted during the last century.

Indigenous forests are thought to have originally covered only 0.1% of the total land area[14] (van der Zel 1989). The natural forest comprised indigenous species such as stinkwood and yellowwood. Significant portions of these forests were destroyed, largely through over-exploitation by European settlers in the nineteenth century.

In 1882, the Cape Colony appointed a 'Superintendent of Woods and Forests' to try to control the cutting of wood from Cape forests. This and similar efforts, however, met with little success, and by 1939, the Government of the Union of South Africa was forced to stop all cutting in natural forest areas (van der Zel 1989). Today there are approximately 200 000 hectares of natural forests left. These are protected areas, and very little harvesting is permitted.

Various local and national government authorities foresaw the need for timber plantations to be established, in order to fulfil the timber requirements of the growing South African population. The first plantation forests date back to 1890. Between 1890 and 1900, most plantations were small, and designed to meet the requirements of local communities. From the turn of the century, larger timber plantations were established, mostly by government authorities. This was insufficient, however, to prevent severe timber shortages when timber imports were cut off as a result of World War I. These shortages prompted the state to embark on more extensive afforestation programs. As van der Zel puts it:

[14]It is possible that the extent of natural afforestation was greater, and that tracts of forest were destroyed without trace. The Department of Forestry believes, however, that "even before the arrival of white and black inhabitants of the country, Southern Africa was poorly endowed with natural timber" (van der Zel 1989:3).

"The timber famine occurring during the War years, was a strong motivation after the War for the RSA Government to establish sawtimber plantations with the object of attaining self sufficiency within 50 years. The economic depressions in the post-war period, and the unemployment coupled therewith, provided the incentive for the RSA government to embark upon large afforestation schemes to provide a living to poor Whites and returned soldiers" (van der Zel 1989).

From 1920, therefore, plantation afforestation began to occur in earnest. Private industry was responsible for some afforestation, but until the 1960s, the bulk of activity was taken up by the state. The species that were planted were all exotic, mostly sourced from Australia and California. From 1920, afforestation proceeded steadily. Over a million hectares of commercial forest were planted between 1920 and 1990, transforming South Africa's position from a net importer of timber, to a significant net exporter of timber and forest products.

Although South Africa is now in a position to meet the demand for commercial timber, and to export timber products, there are severe shortages of wood as a source of fuel in the rural areas. The Ministry of Mineral and Energy Affairs estimates that one third of South Africa's population depends on wood as a primary source of energy. This is equal to the proportion of people who rely primarily on electricity. The Ministry estimates that some 10 million tons of firewood are collected annually. This is almost equal to the entire commercial forestry crop. The wood which is collected is mainly drawn from woodlands, shrubs, and indigenous forest (Ministry of Mineral and Energy Affairs 1992). This situation is unacceptable, both in terms of rural development and environmental protection. There is an urgent need for the development of sustainable forms of forestry which are able to provide fuel to rural people. This will have to be considered in the context of a national energy strategy.

4A.2 The current size of commercial forestry

There are currently 1.37 million hectares of commercial plantation forest in South Africa. This area corresponds to 1.1% of the total land area.[15] Plantations are equally divided between softwood and hardwood species. Plantations dedicated to the production of pulpwood (wood as a raw material for pulp), comprise 38% of the total.

73.5% of the total area is privately owned. Private companies (as opposed to individuals) own 58.25% of the total area. The company land is mostly owned by the three largest forestry companies. Mondi owns approximately 35%, Sappi 30% and HL&H 20%. A further 15% is owned by individuals or partnerships, who are organised under the umbrella of the South African Timber Growers Association. The other 26.5% of the plantation area is owned

[15]This is a very small proportion when compared with some other timber producing countries. In Sweden, for example, 60% of the land area is afforested.

by the state.[16] State plantations are mostly dedicated to softwood species, specifically pine trees. The state owns 43.9% of softwood plantations, but only 9% of hardwood plantations.

Timber plantations are most concentrated in the Eastern Transvaal and Natal, forming a forestry belt in the eastern highlands of the country. 49% of the total forest area is planted in the Transvaal, 40.6% in Natal, and the remaining 10.4% in the Cape (Department of Water Affairs and Forestry 1992).

64000 people are directly employed in commercial plantations and in roundwood transport.

4A.3 International competitiveness – price and quality of pulpwood

The commercial forest plantations produce roundwood, which is converted into a wide variety of products, including mining timber, sawlogs, woodchips, poles, charcoal and matches. For the purposes of this study, however, only those products relating to the paper sector will be considered. These products are pulpwood and pulpwood chips.

South African pulpwood has a number of advantages relative to pulpwood produced internationally. Our pulpwood grows quickly (7–10 years for hardwoods; 15–18 years for softwoods); it is harvested from managed plantations which are dedicated to pulpwood production, and the quality of the timber is well-suited to pulp production, thanks to cloning of successful tree types.

These advantages are, in no small part, the result of extensive and ongoing forestry research and development which is carried out by the state, (currently through the Forest Science and Technology Division of the Council for Scientific and Industrial Research), and by private companies. The privately funded Institute for Commercial Forestry Research, and the Forestry Faculty at the University of Stellenbosch also conduct ongoing research. Research topics include tree breeding, growth prediction and tree improvement. There is little doubt that forest research has contributed to the development of high-yield plantations, which are well suited to specific areas and products. Research has raised both the speed of growth and the yield of pulpwood species.

The advantages described above translate into high quality pulpwood at good prices. On an international scale, our pulpwood prices are highly favourable.

In mid-1992, South Africa's average softwood price was 74% of the average cost of twelve softwood producing regions. At the same time, our hardwood price was 70% of the average of ten hardwood producing regions. South Africa's price position is similar to the U.S.

[16]In April 1993, State forests were commercialised, and are currently managed by a State-owned company called the South African Forestry Company Limited (Safcol). The impact of this commercialisation is discussed below.

South, New Zealand and Chile. Our prices are, however, substantially higher than prices in Brazil, the world's lowest cost producer.[17] Comparative pulpwood costs are illustrated below:

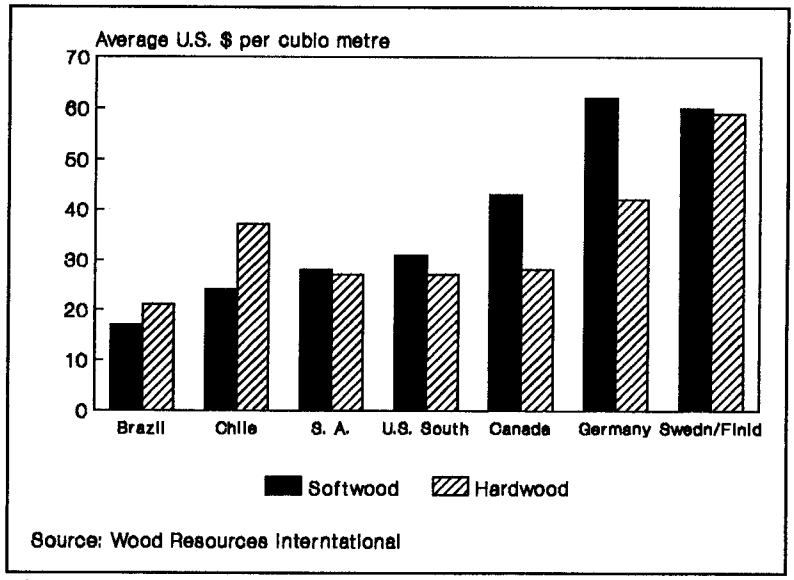


Figure 6 Comparative international wood prices: 1992

In 1991 8.8 million cubic metres of pulpwood were processed. This represents 56% of total roundwood sales. The demand for pulpwood has increased rapidly over the last ten years, largely as a result of the establishment of large new pulp mills such as Ngodwana and Richards Bay. Pulpwood consumption grew by 7.5% per annum during the 1980s. Exports of pulp and paper now account for almost 40% of pulpwood demand.

Another pulpwood growth area is the export of *pulpwood chips* by South African forestry companies. Pulpwood chips were first exported to Asia in the 1970s, but the volume has grown enormously since then. In 1993, a total of approximately 1.2 million tons were exported by four different companies. Two of the companies are co-operatives of small timber growers (Central Timber Co-operative and Natal Co-operative Timber). The third, HL&H, is a forestry company which is diverting hardwood from the declining mining tilber industry, into pulpwood chip exports. The remainder is exported by the state-owned forestry company, Safcol.

By the late 1990s, pulpwood chip exporters hope to be exporting up to 2 million tons per annum. That would make South Africa one of the top three wood exporters in the world.

[17]Prices are U.S. dollars per cubic metre, and are sourced from various publications of Wood Resources International Limited.

The total demand for pulp fibre, (including pulpwood, pulpwood chips, sugar cane bagasse,[18] recycled paper,[19] and sawmill and forest residue), was about 9.5 million tons in 1993.

4A.4 The future supply of pulpwood

It is vital for the South African paper sector to maintain a sufficient supply of pulpwood at internationally competitive prices. Any future growth in the paper sector will be dependent on sufficient raw material supplies.

There are a number of factors that impact on the volume and price of pulpwood supplies in the future. These are:

- limits to further afforestation
  - environmental impact
  - land disputes
- alternative sources of fibre
- competition with other end-users
- upward pressures on pulpwood costs

These will be considered below.

Limits to further afforestation

Unlike some of our competitors, South Africa does not have extensive opportunity to expand commercial forest plantations. Because our forests are exotic, and are planted in areas which do not naturally support afforestation, there is a limit to the amount of afforestable area in the country. Rainfall is the major constraint on further afforestation, as commercial forestry needs at least 750mm of rainfall per annum.

Between 1988 and 1992, new afforestation has progressed at a rate of 2.8% per annum.[20]

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[18]Bagasse is sugar cane waste, which is used as a raw material for pulp, by a mill producing coated paper, in Natal. About 250 000 tons of bagasse are processed annually.

[19]According to the Packaging Council of South Africa, 600 000 tons of paper and board were recycled in South Africa in 1990.

[20]New afforestation as a percentage of the total plantation area.

There are widely divergent estimates on future possibilities for further afforestation. In 1989, the Department of Water Affairs and Forestry released the *Strategic Forestry Development Plan for South Africa.* The plan aimed to double the afforested area in South Africa by the year 2020. The view that the afforested area could be expanded to that degree, is, however, widely discredited in the industry. Forestry companies and industry analysts believe that South Africa lacks suitable land and water resources to allow for such an ambitious increase in afforestation.

There is an emerging consensus in the industry, and among forestry analysts, that commercial plantations could be increased by no more than 30–35% (an additional 450 000 hectares).

Some industry analysts are, however, much less optimistic, and believe that no more than 200 000 hectares could be added to the current plantation.[21] This would be an increase of 15%.

Even these estimates may, however, be too optimistic. There are a range of factors, besides rainfall, that threaten further afforestation.

One of the most important of these concerns the impact of forestry on the environment. This is examined below:

Environmental impact

South African commercial forestry has a number of negative environmental consequences. The most important of these perhaps, is the impact on water resources. Forest plantations impact on water resources in the following ways:

- Forest plantations not only use water, they also impact on the water production patterns in a catchment area. Because forests in South Africa are often planted in areas which were previously grassland, they alter the patterns of water flow in a given area. In a grassland area, some rainfall would 'run off' the land and into the rivers, and some would seep into the ground and enter the river system via the water-table. Forests which replace grasslands, instead trap and use a portion of the water, thus preventing it from entering the river system. In this way, users of water further on, are deprived of water which would have flowed downstream, were it not for the forest plantations. Forest plantations then, have the effect of reducing runoff. Although forests are not irrigated, they are direct users of water resources through runoff reduction. The Department of Water Affairs estimates that in 1990, reduction in runoff as a result of forestry was 1427 cubic metres – equivalent to 7.8% of all water used in South Africa.

[21]Interview, M. Edwards, Forest Owners Association, Johannesburg 1992.

- Forests use groundwater, and often have the effect of lowering the water-table. The Department of Forestry estimates that each plantation tree uses an average of 25 litres per day. But according to a recent study conducted by the CSIR, eucalyptus trees can use up to 120 litres per day under certain conditions (Johns 1993).

- Forests prevent part of the rainfall from reaching the ground, because rain water is caught in the forest canopy, and evaporates before reaching the ground.

- Forests contribute to water loss through transpiration.

- If forests are planted too close to rivers (ie. in riparian zones), they destroy vegetation on the river bank, and thus destabilise the area, creating the possibility of erosion.

For these reasons, South African forestry is regulated by the Afforestation Permit System. Before new afforestation can take place, a permit must be granted by the Department of Water Affairs and Forestry. The permit system is designed to measure the runoff reduction which would be caused by the proposed afforestation. After a process of evaluation, a permit is issued which allows a certain proportion of the land to be afforested. Under the permit system, afforestation is not permitted in riparian zones – stretch of land within 20m of any waterway. In addition, forests are not usually permitted to take up more than 75% of any property (Management of the Water Resources of the Republic of South Africa 1986).

In theory, the permit system should protect the water resources from over-exploitation as a result of forest plantations. However, there are real concerns among environmentalists about the effectiveness of the permit system, given the serious water shortages in the country. One concern is that the permit system is based on experiments that were done in 1972, and that the assumptions made at the time are not longer valid. Since that time, for example, new clones have been developed, which grow faster and use more water. There is also concern that the permit system is not sufficiently able to take into account the differences between catchment areas, and that permits are thus inappropriately allocated. Of most concern perhaps, is the allegation that regular contravention of the permit limitations take place, and that little or no action is taken against offenders – no company or individual has ever been prosecuted for contravening the permits (Johns 1993). Despite this, a study of five river systems, conducted by the South African Wildlife Society in 1991, showed serious contravention of permits on state-owned forest land. In particular, the rule forbidding plantation in riparian zones was been widely ignored. The Wildlife Society notes that "riparian zones on the private forest plantations of Sappi and Mondi are being soundly managed within the permit conditions . . . while riparian zones on state forestry land are overgrown with no sign of reparation. In fact, on some state forestry land, new plantings are in direct contravention of the 20 metre rule" (Wildlife Society 1991).

Another concern is that the Permit System was only introduced in 1972, and has only been applicable to new afforestation. As a result, almost 70% of forest plantations are not regulated by permits (Johns 1993).

Concern over water usage extends to the need to protect wetlands. At present commercial forests encroach on large areas of wetlands along the south eastern coast, including the St. Lucia system. The destruction of wetlands is a major source of environmental concern in South Africa at present.

There are also other forms of environmental degradation associated with commercial forestry, which are not taken into account by the permit system. One example of this is the impact of plantations on biological diversity through the destruction of plant and animal habitats. When an area is cleared for afforestation, the existing habitat is destroyed. Since the new environment, the forest plantation, is a mono-culture, it provides a much poorer habitat for fauna and flora species. In addition, plantation forests are often invasive, because they consist of exotic rather than indigenous trees. As a result, much of the previous flora is unable to survive, and the indigenous fauna is deprived of its natural environment.

The Wildlife Society has estimated that between 1988 and 1991, 40% of afforestation permits were issued on land which supports 'Red Data' species.[22] In addition, more than 50% of threatened plants in the Transvaal, and more than 40% in Natal, occur on land with afforestation potential. The upper areas of catchments are particularly important, given their high species richness. Consequently, says the report, afforestation of these areas, "if poorly planned, would result in severe losses of biodiversity . . . This unfortunate circumstance places a particularly heavy responsibility (on forest managers) with respect to the conservation of biodiversity" (Wildlife Society 1991).

The Society also points to a flaw in the permit reallocation system, which nullifies the system's efforts to limit afforestation to 75% of a given land area. The present system of permit reallocation allows land owners to plant up successive portions of a piece of land without ever rehabilitating the previous portion. In this way, the entire land area is afforested at one time or another, and as a result, the whole area loses its indigenous vegetation.

A third environmental problem associated with commercial forestry in South Africa is the impact of forests on scenic landscape. Large scale afforestation tends to provide a boring, monotonous landscape, and also obliterates views from mountain passes by creating a solid wall of trees around the pass. The Wildlife Society is especially concerned about the effect of existing forestry on the Eastern Transvaal escarpment, and about proposed forestry in the Natal Drakensberg. The Society concludes that:

"As South Africa builds its reputation internationally as a significant tourist destination, scenic considerations will have to play a greater and greater role in landuse planning" (Wildlife Society 1991).

[22]Red Data species are those which are considered to be in direct danger of extinction or likely to become endangered. The fact that certain species become endangered is often an indicator of environmental distress in the region.

Some environmentalists argue that eco-tourism represents a better use of land than forestry, and that tourism should be promoted rather than forestry. They argue that eco-tourism could match forestry's economic benefits – such as employment and foreign exchange – without damaging the environment (Johns 1993). It is unlikely however, that a blanket decision in this regard could be made. Conflicts between eco-tourism and forestry will have to be resolved on a case-by-case basis.

Despite the various criticisms of forestry practise, few environmental groups oppose commercial forestry *per se*. The Wildlife Society, for example, acknowledges that "industrial (forestry) activity is a perfectly legitimate and necessary activity which can have a number of positive environmental effects". The Society also believes that the major forestry companies have made significant efforts to fulfil their environmental responsibility, particularly with regard to the protection of indigenous forests. Indeed it seems clear that the major forestry companies have demonstrated ongoing consideration for environmental issues. There *are* serious concerns, however, that environmental damage is still taking place, and that state forestry in particular, is insensitive to the need for environmental protection.

An industrial strategy for the paper sector must aim to achieve maximum economic development with minimum environmental degradation. In this light, the paper sector's need for increased raw material supply must be weighed up with the environmental damage which this may cause. The current permit system seems flawed, in both its design and its implementation. A re-vamped permit system, which takes account of water shortages, the destruction of biological diversity, and the maintenance of scenic views is urgently needed. Such a system may place stricter limits on further afforestation (and even reverse afforestation in some areas) but it would ensure that afforestation is both sustainable and publicly accepted.

This impacts on estimates of the potential for further afforestation. The current estimates are based on the existing permit system, and as a result, there may be less potential for further afforestation than is currently believed.

Land disputes

Another factor which may constrain afforestation is the possibility of land disputes. Commercial forestry covers large portions of land in certain areas, particularly in the Transvaal and Natal. In the south eastern Transvaal, for example, 20% of the total land area is afforested (Johns 1993). As a result, forest companies, like other major land users, are likely to be affected by land claims. The claims could come from two sources – victims of apartheid removals, and labour tenants on farms which have been bought for the purpose of afforestation.

Some land disputes between rural communities and forest companies have already occurred. In a recent case in Louwsberg, Natal for example, a group of 14 families, with the help of

the National Land Committee, has "convinced Mondi Forests that they have the right to stay on land which they have occupied for generations" (Randall 1993).

The future of land disputes will depend to some extent on land reform programmes. Land reform could mean that communities who were removed from land which was subsequently afforested, could reclaim land, or claim compensation. This may serve to disrupt or limit further afforestation. The outcome of such disputes would depend on the principles and mechanisms created to resolve land ownership questions in the country.

Alternative sources of fibre

There are various ways of increasing the supply of fibre, without further afforestation. These are:

- higher timber yields
- increased recycling of paper and board
- diversion of timber from other end-users

Fibre supply could be increased by improving timber yield, through tree breeding and selection. Such improvements would however, be relatively marginal.

Another way of increasing fibre supply is to raise the level of recycling of paper and board. At present, South Africa recycles some 600 000 tons of paper and board at 63 recycling plants, employing 3400 people.[23] This represents 34% of the volume of paper consumed in South Africa per annum. This is close to the international average of 37%, but way below the recycling levels achieved in some countries including the Netherlands (53%), Germany (47%) and Sweden (46%).[24] South Africa's recycled fibre recovery is equal to 28% of our total paper and board production. This is lower than the 37% international average, and way behind the European Community rate of 52% (Pearson 1992a).

Most recycled material in South Africa is used in the production of paper packaging, such as corrugated boxes, and folding boxboard. In contrast to many European countries, there is very little available in South Africa in the way of locally produced printing papers with a high proportion of recycled fibre.

There are difficulties associated with collecting paper waste in South Africa. Outside of the large cities, our population density is low, and this makes the collection of paper economically unviable. Much of the paper and board recycled in South Africa is collected from waste dumps. This involves a process of separating paper from other waste at the

[23]Packaging Council of South Africa 1990.

[24]J. Pearson *Pulp and Paper International* October 1992.

dump, rather than at the source of the waste. Much progress has been made by paper companies to encourage households, organisations and industry to separate paper waste and make it available for recycling. However, much more progress is possible. It may be feasible, for example, for larger municipalities to collect paper (and other different types of waste) separately, thus eliminating the need for sorting at the dump. Greater local government involvement could increase levels of recycling, and reduce the cost of collecting paper.

It is also necessary, however, to ensure that there is a sufficient market for recycled goods. In the absence of market acceptance of recycled fibre, little progress is possible.

What is clear is that increased recycling would not only expand the fibre supply, it would also create more jobs, and decrease the volume of solid waste which is incinerated or dumped in landfills.

Competition with other end-users

It may be possible to increase the fibre supply by diverting roundwood from other end-users. On the other hand, competition from other end users may limit roundwood supply to the pulp sector.

In South Africa, plantations are separately managed according to their end-use. After pulpwood (38%), the largest plantation areas are sawlogs (35%), and mining timber (22%) (Department of Forestry and Water Affairs and Forestry 1992).

Sawlog plantations comprise mostly softwood, and are largely owned by the state. Sawlog timber is sold to sawmills, who produce timber products for housing, construction and furniture. Demand for housing timber is likely to increase steeply, as a result of a mass housing program. However, timber is unlikely to form the basic raw material for mass housing, because it is very expensive relative to other materials such as cement and bricks. Nevertheless, timber will continue to comprise a proportion of housing material, and demand for softwood logs will rise. It is unlikely that timber could be diverted from sawlogs to pulpwood, but it is also unlikely that pulpwood supplies will come under pressure from increased sawlog demand.

Mining timber on the other hand is a declining market. Mining timber production decreased 11.3% between 1989 and 1991 as a result of falling demand. Mining timber consumption is expected to continue declining, as a result of decreasing mining activity, and the development of alternative mine support systems. 22% of South Africa's commercial forest plantations are dedicated to the production of mining timber at present. Declining mining timber consumption is expected to free about 1 million tons of hardwood timber by the late 1990s. Current plans are to export the timber in the form of pulpwood chips.

Pulpwood chips currently fetch about US$100 per ton (Financial Mail 1993). Bleached hardwood pulp, on the other hand, fetches about US$420, even at today's severely depressed

prices. Adding value to the timber, by converting it into pulp, would raise foreign exchange revenues, and create more jobs and fixed investment. However, it would also require much greater capital investment – a new chipping plant cost in the order of R50m to build, while a new pulp mill would cost in excess of R2b.

The current price crisis, and low investor confidence in South Africa mean that a company currently exporting wood chips is unlikely to invest in a pulp mill in the foreseeable future. Chip exporters are, however, known to be considering investment in pulp production in the long term. In the event of a serious shortage of pulpwood in South Africa, it is likely that at least a portion of the wood currently earmarked for export would revert to South African production. Given that exports of pulpwood chips currently account for approximately 10% of local pulpwood demand, this would have a significant impact on supply, particularly with regard to hardwoods.

Supply and demand – future fibre availability

The discussion above indicates that in the medium term, increases in fibre supply to the pulp and paper industry seem limited. A supply growth rate of 4–5% could be expected. If timber currently earmarked for pulpwood chip exports was redirected to the local market, a much large fibre increase could be expected with regard to hardwood timber.

Demand for pulpwood will depend on the level of growth in the Gross Domestic Product, and the level of export growth. Historically, growth in demand for pulpwood has been closely correlated with GDP growth, when import replacement and exports are excluded. It is expected that domestic demand for pulpwood over the next decade will correlate closely with GDP growth. Growth in exports will, on the other hand, largely depend on the profitability of pulp and paper exports. If exports regain profitability, expansion of pulp and paper mills, and even the establishment of greenfields projects, could be anticipated. South Africa's ability to increase exports of pulp and paper, will depend partly on availability of fibrous raw material. If demand in the local market increases rapidly, (for example at a rate of 5% per annum), export expansion will be constrained.

Given a 2–4% annual growth in GDP, and marginal export growth, shortages of softwood pulpwood are expected in the next decade, because of heightened demand and a less favourable growth/removal ratio in the medium term. A shortage would result in real price increases for softwood pulpwood. A hardwood shortage is not expected, partly because of the declining mining timber market, and partly because of a more favourable growth/removal ratio.

4A.5 Upward pressures on pulpwood costs

Pulpwood costs in South Africa will face upward pressure in the coming years. There are two major factors which point to pressure for price increases. These are the commercialisation of state forests, and the unionisation of labour.

Commercialisation of state forests

The South African government has a long history of involvement in forestry. The state, in fact played a pioneering role in establishing plantation forestry and sawmilling in the country. However, given that the private sector is now fully involved in forestry, the state may withdraw from involvement in the sector (Interview, Department of Forestry, 1992). Indeed, from 1990 the state decided to follow a path of commercialisation of its forest holdings. In April 1993, management of the state forests was transferred to the South African Forestry Company Limited (Safcol), which, at present, is wholly owned by the state. The aim of the commercialisation process is to bring the management of the forests in line with current market demands, and to lay the basis for a possible privatisation at a later stage.

At present, the state plays a key role in setting prices of softwood, through its long term supply contracts, largely with the sawmilling industry. It is widely believed that the prices offered to the sawmills, and to some extent to pulp mills, have been below the level that would be set in an open market. This practise has been criticised as on the basis that it contains a hidden subsidy.

The immediate impact of commercialisation will be to force the state forests to run profitably. This will put upward pressure on softwood prices. Although the major impact of this will be felt by sawmills, pulp mills which buy their softwood supplies from the state will also be affected.[25]

Unionisation of labour

The second source of upward pressure on wood prices is increasing unionisation of labour. South African forestry is highly labour intensive. Forest labour currently comprises 45-50% of South African wood costs before transport.[26] The price of wood is therefore sensitive to the cost of labour.

Wages in the forestry sector are extremely low when compared with industrial wages in general, and with wages in the paper manufacture and converting sector in particular.

Forest workers who are employed by the larger forestry companies earn an average of R100-110 per week, although the rates are considerably lower in some areas.[27] The average rate

[25]There is already some evidence that the state forestry company, Safcol, is beginning to raise softwood prices significantly. Ryan (1994) reports that Safcol is considering raising prices by up to 50%. Safcol claims that it needs to "bring domestic timber prices in line with the rest of the world." This makes little sense, as local climatic conditions make South African timber much cheaper than most international competitors.

[26]When transport to the mill is taken into account, forest labour comprises around 33% of the final cost.

[27]Estimate based on a sample of forest employers.

for paper and paper products workers is R245 (LRS 1992). Forest workers' wages are, therefore, equal to about 40% of paper workers' wages.

Forest workers also typically work long hours, and perform strenuous work. The average working day in the forests is nine hours.

Employers argue that forest workers are, however, usually provided with housing and meals, and that this raises the cost of labour. Housing is provided in family units or single quarters. Conditions in single-sex hostels are often appalling (Zikalala 1992), but family units have become more common on plantations owned by the larger companies, in recent years. In most areas, primary schooling is provided for children of forestry workers, and mobile clinics are made available to workers and their families. The forestry company bears a large part of the cost of these facilities. Employers estimate that when the cost of wages, housing, medical clinics and schooling are taken into account, their labour cost rises to R750–R800 per hourly-paid worker per month. Some companies have suggested paying workers a 'clean wage'. Under this system, the full labour cost would be paid to the worker, who would then pay the company for housing, food, medical and other benefits. So far this has been rejected by the trade unions (Zikalala 1992).

Women forestry workers suffer particular problems. Women are routinely employed to perform the lowest paid jobs. Some of these jobs, such as bark stripping, planting and weeding are extremely strenuous, and are associated with a variety of health problems.

Many forestry workers do not, however, even enjoy the conditions described above. In an effort to cut costs and increase flexibility, companies have moved towards sub-contracting parts of the forestry process to small, privately-owned contractors. It is estimated that about 30% of all forest work is now sub-contracted, although in some companies, sub-contracting is as high as 50%. Use of contractors has been especially high in the harvesting process. An estimated 60% of harvesting is now performed by contractors. This has lead to substantial retrenchment in the commercial forestry sector.

Sub-contracting allows forest companies greater flexibility in their work practises, because contractors can be brought in 'on demand' to perform tasks that are typically seasonal or short-term in nature. This means that forest companies do not have to carry the overheads associated with a permanent labour force.

But this flexibility is achieved largely at the expense of workers. Although conditions differ between regions and contractors, contract workers are, on average, paid lower rates than company workers, and are provided with fewer benefits. Family housing, medical benefits, schooling and pensions are often not provided. Contract workers typically work longer hours, and have less access to training or health and safety protection (Zikalala 1992). Contract workers are almost completely non-unionised, and are much more difficult to organise, due to the proliferation of employers, and small, rural locations.

The problems of sub-contracting are illustrated by some examples: In 1993 a forest division in Natal recently sub-contracted some of its processes. As a result, forestry company workers were retrenched, but some were re-hired by the contractor. The re-hired workers report that their wages fell by 33% (from R12 per day to R8 per day), and their hours were increased by 20% (Interview, 1993). Another Natal contractor is reported to pay workers R4–R5 per day (Evans 1992). While conditions may be better in some areas, the overall position of subcontracted workers seems bleak.

Sub-contracting may provide flexibility and relieve pressure on pulpwood costs, but it does so at a high human price.

Levels of unionisation are currently low among forestry workers. This is partly due to sub-contracting, but even forestry workers who work for large employers are poorly unionised. Part of the reason for this is that forestry work is spread out over very large areas, and this poses organisational problems for trade unions. Unionisation is also difficult because of authoritarian management practises in many areas. Most forest plantations are located in conservative rural areas, where a racist and authoritarian culture often prevails. On state forests in particular, a coercive management style is common (Zikalala 1992).

PPWAWU,[28] the largest trade union organising in the sector plans to pay "maximum attention" to organising forestry workers in the coming years. The Union is also "spearheading a campaign for forestry workers to be covered by the Labour Relations Act" (Quoted in Zikalala 1992).

Some employers are willing to admit trade unions to the forests, and work within the confines of the Labour Relations Act. In some areas, Union recognition agreements have been signed, and dispute resolution procedures are in place. This has had a major impact on the workplace. One employer remarked: "I still remember when we found the first Union guys here – the foresters nearly had a fit . . . but they had to learn quickly. Now they deal with shop stewards, and they have to follow agreed procedures" (Interview, Transvaal 1993).

Other employers, however, are far less prepared for a Union presence: "When you've always made the decisions in the past, without worrying about consulting, you don't feel so happy about suddenly finding that there's another player" (Interview, Natal, 1993).

Increased worker organisation, and inclusion of forest workers under the umbrella of the Labour Relations Act, will create pressure for higher wages.

Some employers argue that forestry wages are comparable to wages in the agricultural sector, and that forestry is essentially an agricultural activity. Others argue that South African

[28]The Paper, Printing, Wood and Allied Workers' Union, an affiliate of the Congress of South African Trade Unions.

forestry wages are comparable to forestry wages paid by competitors such as Brazil and Chile. They argue that any increase in wages would prompt a shift to mechanisation, as employers strive to maintain international competitiveness and that this would jeopardise the badly-needed forestry jobs in the rural areas.

Greater mechanisation would be possible in South Africa. In developed forestry countries such as Finland, Sweden and Germany, forest harvesting is highly mechanised. One worker operating a sophisticated machine, is able to fell, debranch, cut and load a tree, in one process. Forestry workers in those countries are considered, and paid as, skilled industrial workers. In Sweden for example, forestry wages are 5% higher than the industrial average. In South Africa, (and other comparable countries such as Brazil and Chile), a team of 8—10 relatively unskilled workers would perform the above tasks, using a variety of machines. There are some obstacles to increased mechanisation in South African forests, including the need to harvest on very steep slopes. Nevertheless, a substantial increase in mechanisation is possible. According to industry sources, however, mechanisation is unlikely to occur unless wages increase dramatically.

4A.6 Ensuring fibre supply and rural development

There is little doubt that low wood costs are important for the development of the paper sector as a whole. But if low wood costs are maintained at the expense of forest workers and their (rural) communities, then the industry's development will have by-passed an area which is urgently in need of economic development. A successful industrial plan must marry the needs of industry with a development strategy. An industry strategy for the paper sector, must therefore, aim to maximise the supply of low-cost pulpwood, while striving to maintain forestry jobs and improving forest workers' conditions.

Chapter 4B Pulp,[29] paper and paperboard

4B.1 A brief history of pulp and paper manufacture in South Africa

The production of paper was first attempted in South Africa in the 1820s. However, the difficulties of producing paper on a commercial scale thwarted various attempts to set up paper production between 1820 and 1920. The difficulties were related mainly to the development of a suitable fibre resource for the manufacture of pulp — the raw material needed to produce paper. Paper can be manufactured from any vegetable-based matter which contains cellulose fibre. This material must be 'pulped' — or broken down into a mass of fibres. These fibres can then be arranged so as to produce a sheet of paper. In South Africa, various materials, including straw, sugar cane bagasse[30] and wood have been utilised in the production of paper. The first successful paper mills in the country were established in 1920 and 1937. The 1920 Premier Paper Mill, used imported woodpulp for the production of low-grade packaging paper. The 1937 SAPPI[31] Mill was named Enstra — from the words Enterprise Straw — because straw was, at first, used as the fibre source.

After encountering a range of difficulties, Enstra eased into producing a regular supply of various paper grades to the South African market. It was too small, however, to meet demand when imports were cut off during World War II. The War years saw great shortages of paper, and the Government appointed a 'Paper Controller' to oversee the rationing of paper supplies. Hocking (1987) describes how a number of end- users tried to consume paper more sparingly: "Setting an example, the Post Office introduced half-size postage stamps to cut down its consumption of gummed paper. The wine industry identified bottles with paper strips instead of the generous labels favoured before the war. Many businesses converted to half-size stationary, and envelopes were used again and again".

After the war, the industry expanded rapidly, aiming to replace imports of paper in the long term. The period 1948—1970 saw the opening of seven new mills, and a number of paper companies. New local products came onto the market, including newsprint which was originally made at Enstra. South Africa's first domestically produced newsprint was used to print *The Star* in Johannesburg in 1952. In 1954, Sappi opened the Tugela mill which, at the time, was the largest mill on the continent. Tugela was built to produce hardwood pulp, and then convert the pulp into a strong packaging paper known as kraft paper.

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[29]The production of pulp is a mechanical or chemical process which involves breaking wood (or other organic material) into its component fibres. These fibres (bleached or unbleached) can be used in the production of paper, board, non-woven textiles, tissue and other disposables. Pulp is either produced to immediate conversion into paper and board, or for sale on the market. When pulp is sold on the market it is called market pulp.

[30]Bagasse is fibrous waste which is left over from the manufacture of sugar.

[31]South African Pulp and Paper Industries.

In 1967, Mondi Paper Company was born, and the giant Merebank mill was built in Durban. By the 1970s there was a levelling off of activity. The only major investments were in a new machine at Merebank, and a small independent mill at Stanger. The industry also got its first taste of industrial action, as black workers at Tugela walked out of the mill in the midst of the 1973 strikes.

The decade of the 1980s however, was a watershed for the South African industry. Investment, production, consumption, employment and exports all expanded dramatically, despite the general weakness of the South African economy.

The establishment of two world-scale pulp and paper mills in the mid-'80s, and expansion of other mills throughout the decade, led to an annual increase of 7.9% in the industry's fixed capital stock between 1980 and 1990.[32] The new mills – Sappi's Ngodwana,[33] and Mondi's Richards Bay were both massive constructions which cost in excess of R2b. The investment at Ngodwana was the largest private investment in South Africa's history.

The 1980s also saw steady growth in employment, at 3.2% per annum. By 1990, 17 310 workers were employed directly in the industry.

The volume of pulp production increased by 40%[34] during the 1980s, while paper and board production expanded by 33%. Pulp exports grew by 88% (in volume), and paper and board exports by 65%. Imports declined as a result of the new capacity – the volume of pulp imports declined by 90%, and paper and board imports fell by 45%.

Overall consumption of paper and board increased by 12.5%, but per capita consumption declined from 47.3 kg to 44 kg per person per annum. This reflects the poor economic position in the country as a whole during this period.

4B.2 The current size of the pulp, paper and board industry

There are now nine mills in South Africa which produce pulp, but only five which produce pulp for sale on the open market (The remainder produce pulp for their own use in paper manufacture). Of these five mills, three produce 90% of the market pulp. Over 95% of South Africa's market pulp is exported.

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[32]All value data in this chapter (that is, data on the monetary value of investment, production and trade) is sourced from the Industrial Development Corporation 1991 and 1992.

[33]There was, in fact, an existing pulp mill at Ngodwana, but the site was transformed into a major new kraft mill in 1985.

[34]All volume data in this chapter, (that is data relating to the *volume* of production, consumption and trade,) is sourced form *Pulp and Paper International Fact and Price Books* for 1991 and 1992, and *Pulp and Paper International* (July 1992).

Five types of pulp are produced in South Africa. Two of these — sulphate or kraft pulp, and dissolving pulp — comprise the bulk of pulp produced for the market.

In 1991, South Africa produced 2.23 million tons of pulp, including 600 000 tons of market pulp. We exported 550 000 tons of market pulp, of which 350 000 tons was dissolving pulp. Exports accounted for 27% of the volume of pulp production. Pulp exports were worth R1670m in 1990.

Pulp imports are insignificant at 25 000 tons in 1991. This pulp is imported because it is a specific grade which is not produced in South Africa.

There are 19 paper and board mills in the country. Together they produce a very wide variety of grades. In 1991, South Africa produced 1.8 million tons of paper and board. Of this production, 517 000 tons, or 29% of the volume of production was exported. Paper and board exports were worth R612m in 1990. At the same time, 155 000 tons of paper were imported. This represents 10% of the volume of paper and board consumed in South Africa, and 14% of the value of the South African market.

In 1990, the pulp, paper and board industry comprised 3.7% of all manufactured exports from South Africa. The industry also contributed 2.9% of all manufacturing value-added, and 3.2% of manufacturing fixed capital stock (IDC 1992).

It is a highly capital intensive industry. Capital stock grew rapidly during the 1980s, to reach a high of R4221m in 1984.[35] Capital stock was valued at R2890m in 1990.

The profitability of the industry has fluctuated, largely in response to the fluctuations in the international pulp and paper commodity cycle. The level of profitability is illustrated on the following page:

[35]Constant 1990 Rands.

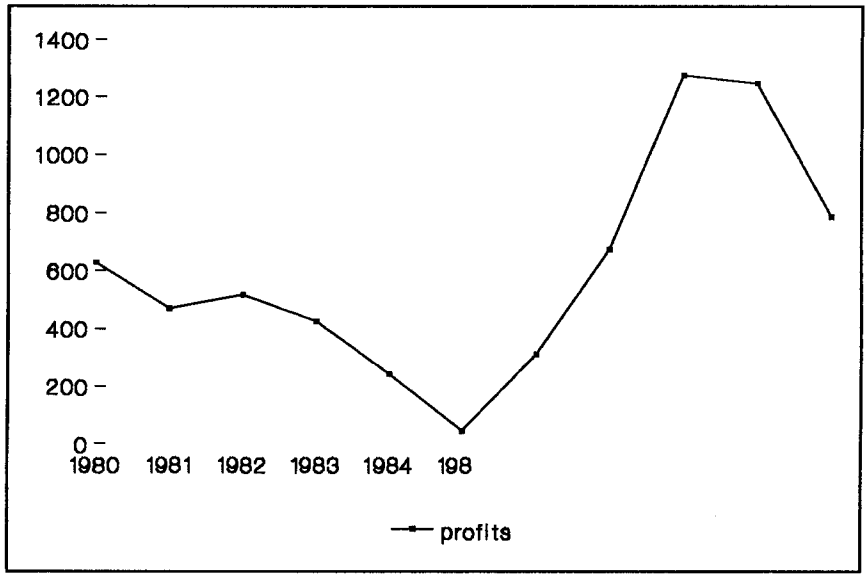

Figure 7 Real Profits in the Pulp, Paper and Paper board industries 1980–1990

Although comprehensive data for the industry is not yet available for 1991 and 1992, it is clear from the results of the largest manufacturers that profits continued to slide. This is illustrated below:

Earnings after taxation	Mondi[36]	Sappi[37]
1990	R114m	R638m
1991	R110m	R345m
1992	R 51m	R303m

South Africa's profit patterns are generally in line with international trends. This reflects the industry's exposure to the cyclical nature of international pulp and paper prices (See Chapter 3). The dip in profits in 1983–1985 however, is in contradiction to international trends, and was probably a result of very large capital expenditures during that period.

Output per worker in the industry has increased steadily. Between 1972 and 1990, the productivity of labour increased by almost 60%. The real value of salaries and wages

[36]Mondi Paper Company Limited, Annual Reports; Price (1993).

[37]Sappi Limited Annual Reports.

however, increased only marginally during that period, and as a result of these two factors, the real unit labour cost[38] declined in real terms between 1972 and 1990 (IDC 1992).

South Africa's wage rates for hourly paid workers are low in comparison to most other paper producing countries. They are, however, high when compared with wages in Latin America. This is illustrated below:

Table 2: Average paper industry wages for selected countries: 1990 (US$/hr) (Source:ICEF 1992)[39]

Country	US$/hr
Canada	15.50
Chile	2.06
Finland	13.86
Germany	14.33
Japan	14.46
Mexico	1.35
South Africa	*3.66*
Spain	9.55
Sweden	18.23
United Kingdom	13.01
USA	12.30

4B.3 International Competitiveness

This study indicates that South African pulp and paper manufacturers have important advantages over many other exporters, but that, to some extent, these advantages are eroded by inefficient production. South African producers are internationally competitive, but not as competitive as they could be.

Our inefficiencies are rooted in three different problems:
a) we operate our mills inefficiently (so that even the most modern technology is not used to its maximum benefit);
b) some of our mills are old and need investment; and c) as a result of import protection, we produce too many products in some mills and thus impair our efficiencies.

[38]That is, the cost of labour per unit of production.

[39]The International Energy Chemical and General Workers' Union who published these figures warns that exchange rate changes and differences in the number of hours worked may distort these figures. However, they are an adequate general indication of wage rates in the various countries. The South African figure was cross-checked with 1990 wage rates at a large pulp and paper mill. The ICEF figures were found to be slightly higher than the average wage at that mill.

The notion that we are inefficient producers is not a new one. The National Productivity Institute, for example, has published figures which suggest that our productivity in this industry is among the lowest in the world (NPI 1992). This is illustrated below:

Table 3: Value added per employee in paper and paper products 1989 (US$)

Country	**US$p.a.**
Australia	61923
Brazil	48407
Canada	91459
Chile	69876
Finland	85293
Japan	91325
Mexico	26724
Singapore	34964
South Africa	*33208*
Sweden	85989
United Kingdom	47732
USA	99036

These sorts of figures are often quoted along with the argument that South Africa's poor manufacturing performance is somehow the 'fault' of labour, or of the trade union movement.

One employer argued:

"People in South Africa don't like work – they like striking, they like toyi-toying, they like believing their labour is worth a fortune. But they don't like working" (Interview, Transvaal 1992).

Another said:

"Our efficiencies are lower than our (international) competitors – we've got a shortage of skills, a terrible work ethic and these trade unions. How can we be expected to compete?" (Interview Transvaal 1993)

What I hope to demonstrate, is that poor efficiency is not simply the 'fault' of either management or labour, but is the result a number of factors including levels of investment, skill, work organisation, and import substitution manufacturing.

These various factors will be illustrated during a discussion of each product grouping in the industry.

Pulp

Pulp represents a major addition of value to wood. The value added from the wood to the pulp stage, is probably the highest in the paper pipeline. The production of pulp is also key to the success of the paper sector, because it is the basic raw material for paper manufacture.

There are a number of factors which place South Africa in an internationally competitive position with regard to pulp production.

As noted in Chapter 3, the international industry is still dominated by North America and Scandinavia. Southern producers are however, gaining market share, largely because the lowest pulp production costs are found in those regions where fast-growing timber is available. This is because wood comprises a high proportion of the total pulp cost. Higher overall costs prevail in the Northern regions, because of the high wood price. Of the Southern producers, Brazil and Chile have the lowest wood costs, and southern USA has average wood costs. Of the northern producers, Sweden has average wood costs.

An indication of the comparative competitiveness of these four pulp producers is given below. The lowest cost producer = 100. The competitiveness of the other producers is shown relative to the lowest cost producers.[40] The wood cost as a proportion of total cost is also shown.

Table 4: Pulp production cost comparison 1991/2
Lowest cost producer = 100

	Bleached hardwood kraft pulp	Wood as % of total cost	Bleached softwood kraft pulp	Wood as % of final cost
Brazil	100	24%	—	—
Chile	—	—	100	25%
Southern USA	105	28%	110	30%
South Africa	110	29%	115	32%
Sweden	140	44%	150	48%

[40]The data used for calculating these comparisons was drawn from a number of sources including Resource Information Systems Inc. (1992), various local and international interviews, and personal communications. The comparisons are intended as an approximate indication of relative competitiveness, and not as an exact measure.

This table illustrates the significant advantages enjoyed by the southern producers. There is a strong correlation between wood costs and final costs. Brazil and Chile, which have the lowest wood costs are at the greatest advantage.

South Africa's wood costs are comparable to Chile for softwoods, and to the southern USA, for both hardwoods and softwoods. South Africa then, enjoys a similar competitive advantage in the international pulp market, as direct result of favourable wood costs.

Cheap wood is then, a key advantage for South Africa in the international market. But we also have other advantages, such as relatively cheap energy. South Africa's energy costs are among the lowest of the major pulp producers. Of a sample of five major pulp producers, South Africa's cost was 13% below average (Edwards 1990). Given that pulp production is an energy intensive industry, a low energy cost is important. Energy costs are typically 3–5% of total pulp production costs.

Labour costs are another important element – they typically comprise 7–12% of the final cost. As illustrated in Table 2 above, South Africa's labour costs are much lower than pulp producers in developed countries, but they are higher than the rates paid by producers in Latin America. Given that mills in South Africa and Latin America tend to use significantly more labour per ton of product, the labour cost per ton is only marginally lower for producers in South Africa and Latin America.

Freight costs are an important component of total cost for exporters. Because of South Africa's geographic position relative to the major consumer markets, freight and sales costs are relatively high for South African exporters. Freight and sales costs comprise 15–20% of final costs of exported pulp delivered at a northern port.

Pulp usually crosses international borders without tariff duties.

Capital costs are also an important element of the cost structure, because pulp production is highly capital intensive. Capital costs usually comprise about 25% of final costs. South African producers claim that they face capital costs which are significantly higher than their competitors, due to high interest and inflation rates. However, South African producers enjoy tax and export benefits that are generous when compared to many other pulp producing countries. A recent study in fact shows, that the real capital costs of the paper and paper products sector, has been the lowest of all manufacturing sectors in South Africa between 1972 and 1990 (Fallon et al 1993). This makes it difficult to confirm that South African producers do, indeed, face punishing capital costs.

South African pulp producers then, have a number of important advantages when compared with other major exporters. However, South African producers can only get the full benefit of our cost advantages, if pulp is produced efficiently. This involves two major factors. Firstly, we need to have the best available technology for pulp production, and secondly, we need to use that technology well. In the production of market pulp, most South African

producers do, in fact, have technology which is comparable to the best in the world. Most of our market pulp is produced at three mills, all of which are large and modern enough to compete. We do not then, face a technical constraint with regard to market pulp production. However, we do face a problem when it comes to using that technology to best advantage. Our production efficiencies, on average, are below international best practise. This is illustrated by a comparison of the average performance of a number of South African kraft pulp mills with a highly efficient kraft pulp mill in Europe (For the sake of convenience, the South African mills are called Safpulp, and the European mill is called Europulp).

	Safpulp	Europulp
Planned downtime	4.4%	2%
Unplanned downtime	5.4%	0.9%
Raw material yield[41]	87%	96%
Person hours per ton[42]	5.1	2.07

In comparison with the European plant, the South African plants achieve low levels of plant utilisation. The Safpulp plants are down an average of 10% of the time, due to planned or unplanned downtime (compared with 2.9% at Europulp). Given the extremely high overheads, this practise is very costly. In particular, the degree of unplanned downtime is worrying as it suggests a lack of control over the process, and a low degree of predictability.

The Safpulp plants also achieve relatively low yields on their raw material. An average of 87% of the available raw material is converted into prime saleable product. Europulp achieves a 96% raw material yield, thus making an important raw material saving in comparison to Safpulp. South Africa's relatively low raw material yield, essentially means that we produce more defects than the European mill.

In addition to these problems, the South African producers use significantly more labour to produce a ton of pulp than the European mill. This too, is a costly practise, although it is offset by low wage rates.

In summary, the South African producers use more people, and achieve lower yields on their capital equipment and their raw materials.

In this way, the original advantage provided by the low wood cost is eroded.

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[41]That is, percentage of raw material converted to prime saleable product, which is not discounted or repulped.

[42]Full employee complement, including management.

South Africa's relative inefficiency has given raise to a situation where we use our wood (and other) cost advantages partly to cushion our performance, rather than using those advantages to maximise our competitiveness.

That practise may have worked for South Africa in the past. Our two largest kraft pulp mills came on stream at a favourable point in the international pulp price cycle. For the first six years of those mill's productive lives, pulp prices were high. However, in the last 2—3 years, prices have dropped dramatically, and the mills have been facing a situation where there is little margin for error or for waste. As one mill manager put it:

"In the past, our big advantages in wood costs have been offset by inefficiencies. But now that prices are so low, the whole world is bringing costs down, because only the lower cost producers will survive. So, we can no longer afford to produce inefficiently. We will need our wood cost advantage just to survive" (Interview, Natal, 1993).

Even when pulp prices recover, it is unlikely that they will reach the highs of the late 1980s. Even if they do, it would still be to South Africa's benefit to produce as efficiently as possible. If we do not need our wood cost advantage to survive, we will certainly need it to prosper.

Producers of South African pulp have a significant exposure to the international market. Pulp can only be produced efficiently in large volumes, and these volumes cannot be absorbed by the South African market at present. If South African pulp producers are to succeed, they will have to continue to export a large proportion of production. At present, 28% of all pulp produced in South Africa is exported. At the three largest pulp mills, an average of 63% of pulp production is exported. This high export proportion is indicative of South Africa's success in the international market, but it is also suggests that South Africa cannot afford to fall behind the international competition. For this reason, it is imperative that we isolate the source of our inefficiencies and eliminate them.

We have noted that there are inefficiencies which stem from the way in which we work, rather than from the quality of our technology. Let us call this 'production process inefficiency'.

What is the cause of this inefficiency? I believe that there are three main sources of inefficiency: a low level of skills; poor work organisation; and a high level of conflict and dissatisfaction among mill employees (These are discussed more fully at the end of Chapter 4B, after a look at the paper and board industries).

An international efficiency comparison such as the one above, is not available for every product grouping in the pulp and paper industry. However, the problems associated with this type of inefficiency are general problems that stem from our social and industrial environment, rather than from something specific to the production of pulp. It is likely therefore, that the 'production process inefficiency' described above is not only found in the

production of pulp, but also in the production of various types of paper. Paper production, however, also suffers from other types of inefficiency, and these are discussed below.

Lower value papers: Newsprint, corrugating papers and folding carton board

The manufacture of newsprint and corrugating papers, (such as kraftliner board[43] and fluting[44]), is similar in many ways, to the production of pulp. These papers are commodities, which are highly traded on the international market and which require relatively little specialisation. In South Africa, their production is often integrated with the production of pulp. Pulp is fed directly from the pulp mill onto the paper machine. Like pulp, newsprint and corrugating paper have been subject to severe price deterioration in recent years.

Newsprint

Newsprint, like pulp, is sensitive to the price of fibre, as fibre is a high proportion of the cost structure. In this case fibre is either 'virgin'[45] fibre or fibre which is recycled from waste paper. The cost of virgin fibre is related to either the wood cost or the cost of market pulp. The proportion of recycled paper which is added to the mix, is increasing in many countries. At this point, however, waste is still a small portion of average production costs.

As in the case of pulp, the southern producers tend to be at an advantage due to more favourable virgin fibre costs.[46] This is illustrated below:

Table 5: Newsprint production cost comparison 1991/2
Lowest cost producer = 100

	Newsprint cost: 1991/2	Fibre as % of total cost
Southern USA	100	19%
Sweden	120	29%

[43] Kraft liner board is a strong, brown packaging grade which forms the basis for corrugated boxes.

[44]Fluting is a thin paper which is creped to form the inside of a corrugated board.

[45]The industry refers to fibre which has not been used before as 'virgin' fibre. I dissociate myself from the sexist connotation of this label.

[46]The data used for calculating these costs was drawn from a number of sources including Resource Information Systems Inc. (1992), various local and international interviews, and personal communications.

South African newsprint is at a similar advantage to the southern USA with regard to fibre costs. Energy is also an important element of the cost structure for newsprint (typically 15%), and this increases South Africa's competitive position. In addition, South African newsprint is produced in modern world scale mills. At present, South Africa's newsprint costs are, on average, close to those the southern USA.

Our competitiveness is reflected in our trade performance – in 1991, 60% of our newsprint production was exported, and none was imported, despite the fact that there is no import tariff on newsprint.

Due to the similarities in the production process, and the integrated production of pulp and newsprint, it is expected that the relative inefficiencies demonstrated for South African pulp production above, will be replicated in the case of newsprint production. In other words, it is probable that our newsprint production is inefficient relative to the best-practise producers, and that this is due to our use of technology, rather than our production facilities.

Kraftliner board

The situation for kraftliner (and other corrugating papers), is similar to newsprint. Kraftliner production costs are sensitive to the cost of fibre. Fibre costs are around 45% of total costs for a southern producer, and energy costs are 7–10%. This is again reflected in our trade performance – in 1990, 29% of all kraftliner production was exported, and no kraftliner (or other corrugating material) was imported.

South African kraftliner is largely produced in the more modern South African mills, although a proportion of production comes from the country's older mills.

Kraftliner efficiencies are affected to some extent by the number of grade changes that are usually made in South Africa, relative to the number made by international producers. Due to the small and highly segmented South African market, producers here tend to produce 5–7 grades of liner, as compared to 2–3 grades in Europe, Japan and North America. This leads to more downtime, and a resulting loss of efficiency.

The overall situation, however, is that most of our kraft production is relatively competitive. However, the production process inefficiency documented for the pulp process is almost certainly duplicated in the case of kraft production.

Folding carton board

Folding carton board differs substantially from the other papers we have discussed. It is a waste-based paper, which is produced by only one of South Africa's manufacturers. A large proportion of the cost structure is comprised of recycled fibre. Since South Africa is less efficient at collecting recycled paper, our recycled fibre costs are high. Countries like

Germany, where a national recycling scheme exists, have much lower costs for recycled paper.

In addition to this problem, many of the carton board mills are old and relatively inefficient. Major investment would be required to bring them up to international levels of competitiveness.

One of the mills in which carton board is produced, recently invested in a new state-of-the-art machine, in order to address efficiency and quality problems. However, due to a low level of skills, and to poor work organisation, there have been serious problems with quality of the mill's production (Interview, Transvaal, 1992). This issue is discussed further in Chapter 4C.

Fine papers

The term fine papers refers to high quality papers whose value depends on appearance and surface properties. Printing and writing papers form the most significant segment of the fine paper industry. Printing and writing paper is the fastest growing paper market segment internationally. It is a very diverse segment, comprising coated and uncoated papers, and ranges from commodity-type grades such as copy paper, to highly specialised art papers, or fine packaging grades. It is highly desirable for South Africa to compete successfully in printing and writing papers, because these papers are the highest-value segment in the industry. The competitive situation of South African printing and writing papers is however, quite different from the position of pulp and lower value papers, described above.

South Africa is generally less competitive in printing and writing papers than we are in pulp, newsprint and kraftliner papers. Our lesser competitiveness is reflected in our trade performance: in 1991 we exported 21% of our printing and writing production (85 000 tons), but imported almost as much as we exported (80 000 tons). A large proportion of South Africa's paper imports are printing and writing papers. Some of these are imported because they are not made in South Africa (eg. Light-weight coated magazine paper and thermal facsimile paper.) However, imports of these grades account for less than half of the volume of our total imports. The remainder of imports are in products which compete with South African grades. Printing and writing imports have increased steadily in recent years, largely because massive international overcapacity led producers to explore new markets, including the South African market. A new 10% import tariff on uncoated printing and writing papers was introduced in 1992 and tariffs on printing and writing papers now range between 10% and 15%. It remains to be seen how the new tariff on uncoated papers will influence the extent of imports.

Import patterns for fine papers are illustrated below:

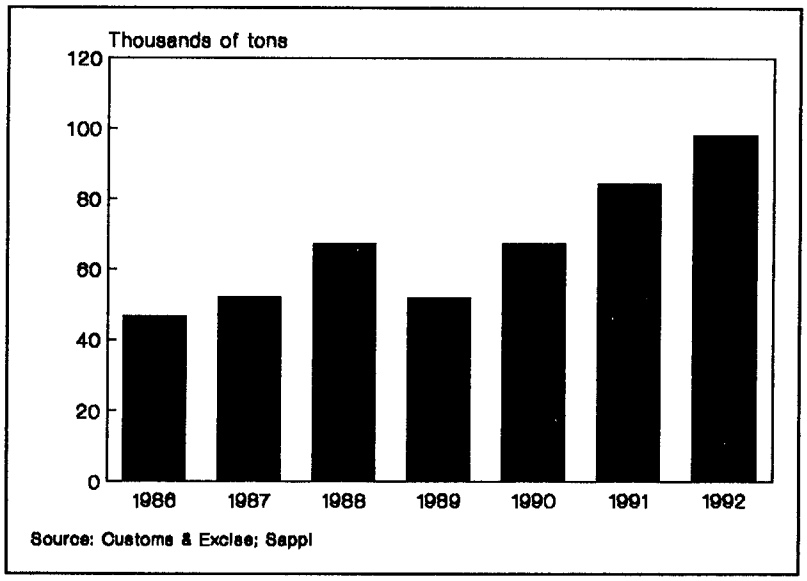

Figure 8 Fine paper imports 1986-1992

There are a number of reasons why we are less competitive in the printing and writing grades.

Firstly, the cost structure is different from pulp and the lower value papers. Printing and writing papers can be divided into a number of different categories. For the purpose of this discussion, I will be divide them simply into uncoated and coated papers.[47] For uncoated papers, fibre comprises 25—30% of the final cost for a southern producer, and 35—40% for a northern producer. For coated papers, fibre cost can be as low as 10% for a southern producer, and about 15% for a northern producer. In other words, fibre is a lower proportion of the final cost for printing and writing papers than for pulp, newsprint or kraft, and southern hemisphere producers have less of an advantage.

The second reason for our lower level of competitiveness, is that a number of South African printing and writing paper mills are relatively old and small, or produce a very wide range of papers.

There is one paper mill in the country, which operates world-scale fine paper machines. It is a large and modern mill, and has a relatively limited range of papers. In volume terms, this mill produces about 40% of the country's printing and writing paper output and exports.

[47]It is possible to divide them further into coated and uncoated woodcontaining, and coated and uncoated woodfree papers. However, for the purpose of this discussion, a broader division is sufficient.

The other three mills where printing and writing papers are produced use relatively old equipment, and produce a very wide range of papers. The strategy followed by those mills, is, essentially to produce low tonnages of a wide variety of products – to be 'all things to all people'. This strategy allows the mills to meet almost every demand of the South African market. Exports are marginal, and usually a result of the need to maximise volumes on the paper machines.

The smaller, more flexible mills present both a problem, and an opportunity. The strength of the mills is that they are flexible enough to produce a wide range of speciality papers. These are mostly sold in the small domestic market, and a small volume is exported. There is potential to increase the export of some of these papers into international niche markets. The mills have developed important skills, such as efficient change-over from one grade to another, and a highly adaptable workforce.

The problem, however, is that the production of commodity grades (such as copy paper), in the small mills cannot be efficient in international terms. Major international producers of commodity printing and writing paper use large machines which are dedicated to the production of a small number of grades. Machine downtime and waste are minimised, and the quality and consistency of the product is high.

The small, flexible mills are, therefore an important resource, for the production of high-value, niche market grades, but inefficient producers of commodity grades.

Some of the small mills do, at present, produce the commodity grades. Although they are inefficient in world terms, they have been able to sell their papers successfully on the domestic market, largely because they are relatively highly protected. Although printing and writing paper imports are subjected to a relatively low nominal tariff structure of 10–15%, the exchange rate and the transport cost make the real level of protection much higher. Estimates of the effective rate of protection vary from 19% (BTI 1992) to 22.2% (IDC 1990).[48] While this rate of protection is not astronomical, it is sufficient to cushion South African producers from international competition. In addition, local competition is necessarily limited by the fact that there are only two major local producers of uncoated papers, and one local producer of coated papers.

Under these conditions of limited competition, the commodity grades produced by the small, wide-ranging paper mills are able to survive, not because they are among the most efficient producers in the world, but because they compete in a protected environment. This practise will be difficult to sustain in the long term.

This situation suggests that South African manufacturers need to invest in more world-scale, dedicated printing and writing paper capacity, in the commodity grades. This would open

[48]Quoted in Peter Fallon et al 1993.

up the way to growth in this important segment of the market, and to more effective competition with imports. However, since the South African market for printing and writing papers is small, a world-scale mill would need to export a substantial proportion of its production. There are certain difficulties associated with this.

Printing and writing papers require a higher level of marketing, customer service, and quick response that the commodities such as newsprint. As a result, the international trend in recent years has been to move printing and writing production as close as possible to the final market. This enables a producer to meet short leadtimes and to provide back-up and customer service. Scandinavian producers have, for example, bought significant interests in Western Europe. This trend has also seen South African producers, Sappi and Mondi buy interests in the European market. Sappi has acquired two printing and writing mills in Germany, (through the acquisition of Hannover Papier), and five printing and writing paper mills in the UK. Mondi has acquired a share in Austrian companies Frantschach and Neusiedler, who are also manufacturers of printing and writing papers.

Through these acquisitions, Sappi and Mondi have greatly expanded their printing and writing paper capacity. They have done so through acquisition of mills close to the final market, rather than expansion of local production.

Some players in the industry argue that the South African companies should continue to grow their printing and writing market share through international acquisitions rather than through the export of locally-made products. Such a strategy would mitigate against investing in world-scale mills in South Africa. One of the reasons given for this is the need to be close to the market.

It is important to evaluate whether the service demands of printing and writing papers do indeed prevent significant export of printing and writing papers produced in South Africa. There is little doubt that pressure on leadtimes has increased, and that customer service has become a more important part of the paper industry. However, these factors are not equally applicable to all parts of the printing and writing paper market. In the commodity-type sectors (such as copy paper), there is in fact little demand for specialisation or lead time. Given a basic level of quality and consistency such a product is more sensitive to price than service, and can be warehoused and sold from stock. Brazilian copy paper for example has a major share in European market, because of its competitive price.

At the other end of the scale, relatively specialised printing and writing papers are often made for stock and then sold from warehouse, even in Europe. One of the South African owned mills in Europe, for example, which produces uncoated printing and writing papers, has a four week production cycle, and essentially operates as a stock mill. The mill's comparative advantage is to produce a very wide range of products (over a thousand grades in all), rather than reacting quickly to the market.

This suggests that the products of the smaller and more flexible South African mills could be sold from stock. This already happens to some extent — a niche-market, art paper produced in South Africa is now being sold successfully (from stock), in Europe.

While the process of warehousing is undoubtedly costly, it is still fairly common among printing and writing producers in Europe. The two to three weeks needed for delivery from South Africa to Europe will involve some expense (in the form of warehousing) and prevent quick market response.

However, it is clear that there remains a slice of opportunity for exporting South African produced printing and writing papers into international markets. The costs of transport and warehousing, and the import tariff, would have to be borne by a cheaper cost base, and/or a premium paid for niche products.

A number of other conditions would have to be filled in order to make increased South African printing and writing exports viable.

The first is that sales and marketing expertise would need to be available in the end markets. The South African companies' European acquisitions provide them with important opportunities in this regard.

The increased export of printing and writing papers from South Africa would also require greater attention to quality. Some printing and writing papers currently exported from South Africa have drawn criticism in the international market for their inconsistent quality.

Quality is not only a problem with regard to the product itself, but also the systems of service and delivery from South Africa to the international market. Local companies will have to develop a greater consumer orientation if they are to export more successfully.

What does this all mean for the future? I argue that while international acquisitions are important to South African companies' future success, these acquisitions should not replace investment in world-class capacity in South Africa. There is a need for investment in efficient dedicated printing and writing paper machines which can service both local and international markets. It is important for the local industry to compete in this segment, and to complement South African owned capacity overseas. This suggests that a substantial investment in local capacity must be encouraged.

At least one of the major South African companies has indicated that an investment in a world scale fine paper machine can be expected in the next decade. Such a machine would optimally produce large volumes of a small number of commodity-type papers. A substantial proportion of such a machine's output would have to be exported.

4B.4 Production process inefficiency and its causes

We have identified various types of inefficiencies in the production of pulp, paper and board. The one kind of inefficiency which recurs throughout this sub-sector, however, is what we have called production process inefficiency. This refers to relatively inefficient use of our raw materials and capital equipment, and was most clearly illustrated with respect to pulp production. However, it affects all the product groupings. It is therefore important to discuss the causes of this type of inefficiency. I believe that the key problems in this regard, concern skill levels, work organisation, and shopfloor conflict. These are discussed below.

There is little doubt that levels of *skill* are extremely low in the South African industry, when compared to international best practise. In Sweden and Germany, for example, an average paper mill worker will have received 2–3 years training in paper production or related fields, a supervisor is likely to have received 4 years training (ILO 1992). In South Africa, the average worker has probably received little or no post-secondary education. In fact, a large proportion of the workforce will not have completed high school. Data on skill and education levels are not available for the industry as a whole. However, a sample of seven pulp, paper and board mills, reveals the following trends:

Formal educational levels of hourly paid employees:

Std. 5[49] and below:	18%
Std. 6 or 7:	22%
Std. 8 or 9:	31%
Std. 10	19%
Post-matric:	10%

In recent years, however, many of the mills have begun to insist on Std. 8, or even matric, as the minimum educational level for new employees.

Many South African mills use the terms 'unskilled, semi-skilled and skilled' in their employee classifications. A sample of five such mills revealed the following skills breakdown for hourly paid employees:

Skill levels of hourly-paid according to mill classifications:

Unskilled:	26%
Semi-skilled:	28%
Skilled:	31%
Artisans:	15%

[49]International readers please note: Standard 5 is equal to seven years of schooling. Standard 6 equals eight years etc. Matric refers to the final year of high school, which equals twelve years of schooling.

Mills in Europe or Japan would be unlikely to have any 'unskilled' employees on their payroll.

Poor *work organisation* is another cause for concern. South African mills have an average of fifteen employment grades for hourly paid workers, whereas Swedish mills have six. This causes enormous difficulties with regard to communication and problem solving. The elaborate grading system also encourages rigid job demarcation.

Shopfloor conflict is another source of concern. There is widespread evidence of political, racial and trade union conflict, as well as entrenched conflict between workers and management over issues such as centralised bargaining.

In the last five years, most major pulp and paper mills have experienced serious strikes. Some of these have lasted as long as ten weeks. There was considerable violence (on both sides) during some of the strikes. Strike activity has fallen in the last two years. However, there are a number of local and national conflicts which continue to occupy the minds of workers and managers. One of these is the ongoing conflict over the level of wage bargaining. Workers, through PPWAWU, have demanded that wages be negotiated on a national basis, for the industry as a whole. Companies have consistently resisted this demand, and wages are still negotiated at plant level. The demand for centralised bargaining has been a feature of many of the strikes and stoppages in the industry.

At present, the average wage rate is R273 per week (LRS 1992a).

There are also conflicts that are less visible. Racial conflicts and divisions, for example, abound in South African mills. Racism often corresponds with, and deepens other divisions, such as conflict between workers and supervisors. This is significant, because it makes co-operation and problem solving difficult on the shopfloor. The following view was expressed by members of a group of white foremen during an interview in Natal in 1993:

"We need someone to protect white interests at this place . . . the management is now trying to allow the blacks to use our toilets — just let me catch a black or an indian using our toilet . . . "

The same group believed strongly that black people, by law, pay less tax by virtue of their race:

"Blacks are striking and carrying on, but they get more money than us. If we earn the same as them, they pay 1% tax, and we pay 30%".

The racial and political conflict clearly had an effect on the management style of these supervisors. They commented:

"We are intimidated by the blacks, and especially the Union members. As foremen we would like to maintain our line of authority, but now some of us are scared to discipline . . . because these people are getting more defiant. If you try to discipline them, they accuse you of being a racialist, and then they make a complaint against you with the shop steward, and then you have to have an enquiry . . . the black trade unions have made the country ungovernable. Maybe our (white) trade union should start learning something about mass action . . . "

The group expressed concern that 'affirmative action' would take away their jobs. They clearly feel that their job security and their authority are threatened by the presence of a black trade union, and by the current political changes in the country.

It would be tempting to write off this type of racism as unfortunate, but irrelevant to the industry's progress. However, given that black and white South Africans will need to work together more effectively in order to maximise the efficiencies of our mills, racism does present a serious problem. I believe that racial division and suspicion has an enormous, and largely unseen, impact on communication and co-operation on the floor.

This was illustrated in a number of mills which had attempted to introduce Japanese-style 'Green Areas'. The idea of Green Areas is to bring teams of workers together on a daily basis to discuss and resolve production problems, and continuously improve their work. Green Areas have, at best, enjoyed limited success in the mills. Green Areas are usually led by white supervisors, some of whom admit freely that they do not believe that black workers have insights to offer. Many workers, on the other hand, feel cynical about the Green Areas idea and believe that their ideas will not be taken seriously. One worker commented that he would be prepared to make suggestions on how to improve production, "if it could be kept confidential from my head of department" (Interview Transvaal 1992, interview Natal 1993).

A last piece of anecdotal evidence to offer here, is an experience of how a strike at a particular pulp and paper mill revealed a severe lack of communication between workers and managers. During the nine-week strike, the mill was kept running largely by line managers and artisans. While working on the paper machine, an artisan discovered a wasteful and frustrating problem. A part of a particular worker's job was to check the machine temperature on an indicator, and when necessary, adjust it, using a valve. Prior to the strike, the management was unaware that the temperature indicator was located on the bottom floor of the mill, but the valve was located three flights of stairs up. For years, the worker had been checking the temperature, climbing the stairs to adjust the valve, climbing down the stairs to see if his adjustment had had the required effect, and so on. The worker was thus involved in a frustrating and unproductive exercise, and both he and the mill management stood to gain from a simple change. The lack of communication in the mill, however, prevented the problem form coming to light. This is a far cry from the Japanese practise of 'continuous improvement'.

A number of companies have attempted to address the various problems described above. The introduction of Green Areas, for example, is part of a total quality philosophy introduced by some companies. Again, however, the success of such initiatives has been limited. At this stage, most initiatives seem limited to a spirit or philosophy of change, rather than a structural change to work organisation and practises.

I came across only one significant departure from traditional work organisation during my plant visits. This was at a pulp and paper mill which had recently installed a new process. Employees in this new part of the mill are all artisans, with at least three years of technical training. The employees in this section are all employed on the same grade, and there is no supervision. By contrast, in other parts of the plant there are up to 21 grades, and extensive supervision. Mill managers feel that while they would like to duplicate this pattern throughout the mill, they will have to wait until there is a sufficient pool of highly skilled employees in the job market. Some managers seemed sceptical that the existing workforce could be trained sufficiently, and believed that they would have to wait for a new generation of school-leavers (Interviews, Natal, 1993).

A number of mills have applied for, and achieved ISO 9000 certification. While this is a positive development, it does not, as we noted in Chapter 3, necessarily improve the efficiency of production.

On aggregate then, traditional work practises are alive and well in the pulp, paper and board industry. Levels of communication are generally low, and there is considerable shopfloor conflict. These problems are at least partly responsible for the inefficiencies demonstrated in the international comparison above.

4B.5 Training

In recent years, the industry as a whole has recognised the importance of improving training, and some companies have begun to invest more heavily in training efforts.

At the level of artisan training, there is a fair amount of co-operation between companies. Companies meet at a national level, to oversee tertiary training for the industry. They liaise with universities, technikons and technical colleges. Certain tertiary institutions, such as the Natal Technikon, offer specific courses in paper production. Other students come through disciplines like engineering and chemistry. In recent years, the German training model has gained influence in South Africa. This model aims to develop paper-making, and similar skills, that are directly applicable in production. This de-emphasises a strictly academic approach, and builds high degrees of technical competence. Industry training managers, however, are aware that the German-style system may produce rigid rather than flexible skills. They hope to combine the best features of the German system (technical expertise), with best features of the Japanese system (flexible skills).

At the level of production workers, however, there is no national training system for the industry as a whole. The major companies all have training programs, but have been unable to agree on a common training program.

One of the major companies recently opened a training college, designed specifically for production workers. Prior to this, production worker training was limited to the plant level. The College offers three months of residential, theoretical training, following by a nine month stint in the mill, where the trainee is supervised by a mentor. This system is designed primarily for existing employees in the industry, rather than for school leavers. There are a number of entry points into the system. The usual basic entry requirement is Standard 7, but a bridging program is available to a certain number of applicants. There are also plans to weave literacy training into the system.

The College is linked to a technical college. It is hoped that national accreditation for the system will be achieved in the near future. This will provide national recognition for workers who have been through the system.

Another major company in the industry trains workers via short modules, rather than relying on a longer, more intensive course. The various modules, taken over a number of years, provide sufficient training for workers to progress up a kind of career ladder. The career path is, however, extremely complex, and the skills do not lead to accreditation in the national education system. In addition, this particular conception of career paths, relies on testing the 'potential' of an employee when s/he is first hired. Psychometric tests are used to determine how much long- term potential the employee displays. Depending on his score, s/he will be assigned to one of eight career paths. The employee can design his own progression within the given path. In order to progress, the employee must apply, and be accepted for training.

In addition to these training systems, there has been a concerted effort to multiskill artisans involved in mill maintenance. This will mean, for example, that instead of an artisan having only engineering skills, s/he will also learn the skills of a fitter. This enables the artisan to solve the various aspects of a maintenance problem, rather taking a more narrow approach.

4B.6 Export and investment incentives

State export and investment incentives play an important role in the industry.

Under the General Export Incentive Scheme (GEIS), exports receive a staggered benefit, depending on the product's level of benefication. The pulp and paper industry exports fall into categories two and three of the GEIS system — 'beneficiated primary products' and 'material intensive products'.

GEIS is a lucrative benefit for major exporters like the pulp and paper producers. In the difficult trading conditions of recent years, GEIS has reportedly comprised as much as 50% of the profit rate of some companies in the industry.

GEIS is controversial in this industry, because the capacity at some of the mills is such that they must export a substantial proportion of their product. The GEIS payment then, is made to mills which would be exporting anyway. This seems to be an inefficient expenditure of state resources, and a more targeted approach would probably be more beneficial to the industry's long term development.

Investment incentives have also played an important role in the industry's development. South Africa's two largest mills were established under highly favourable fiscal conditions. Investment and decentralisation incentives were at their highest level, and these assisted the industry in making the enormous investments necessary to set up a world scale pulp and paper mill. At this time, companies were able to claim tax allowances on capital expenditure over three years, at a rate of 50%, 30%, 20%. At present capital expenditure can be claimed against tax at 20% per annum over five years.

However, even a five year depreciation program may be inappropriate for the industry. The level of capital expenditure in the industry is inherently high, but the capital equipment usually lasts for many years. Companies do not need to make an equivalent re-investment in five years. In this way, paid off mills can continue to operate profitably for many years.

As a result of the investment incentives, tax rates in the industry are exceptionally low. Sappi, for example, has enjoyed a 1.85% average tax rate over the last ten years (Sappi 1992).

Recent changes to the tax rate, which will allow for companies to be taxed on their dividend payments, will raise the tax rate to some extent. It is expected, however, to remain relatively low.

4B.7 Environmental protection

The industry has a mixed environmental record. A highly publicised effluent spill in 1989 has, however, ensured that the industry has a poor environmental image.

The effluent spill at Sappi's Ngodwana Mill, killed thousands of fish in the Elands River. The fish died as a result of suffocation, after the effluent, which was high in oxygen demand (see Chapter 3), absorbed vast quantities of oxygen in the space of a few minutes (Fray 1989).

The effluent spill was a dramatic, and rather unusual accident. Other forms of environmental damage, however, are more commonplace in the industry.

The most important problem concerns bleaching methods in the pulp plants. As we discussed in Chapter 3, there is an international trend away from chlorine bleaching in the pulp industry. Although South Africa was a co-inventor of elemental chlorine free (ECF) bleaching, a number of major pulp plants still use elemental chlorine in the bleach process.

None of the South African mills produce totally chlorine free (TCF) pulp at present. Of the three largest chemical pulp mills, two rely on traditional chlorine bleaching, and one is in the process of converting to ECF bleaching. All three release effluent, either into the sea, or onto land.

Both major pulp producers are looking at the possibility of converting to TCF production in the long term, but there are no definite plans for this as yet.

One area where South Africa's major mills are highly successful, is in minimising the water usage in the production process. A relative scarcity of water forced certain mills to find ways of minimising their water demand. As a result, Sappi's Ngodwana mill, for example, uses 75% less water per ton than the international average in the industry (Fray 1989).

At present, the regulations governing environmental impact (such as effluent disposal and emission control), place little pressure on the industry to practise strict environmental management. At this stage the pressure from the international market is more of a driving force than is legislation.

It is imperative, from both a competitive and environmental point of view, that the industry minimises its impact on the environment. In order to keep pace with international trends, the local industry will need to invest heavily in the years to come.

Chapter 4C Paper products

4C.1 A brief history of paper products in South Africa

The paper packaging industry in South Africa is said to have been started in 1780, when a Cape Town woman (her name forgotten), used paper to wrap fruit and send it to the Dutch East Indies. By 1780, 'East Indiamen from the Netherlands' regularly delivered paper and cardboard for the making of packaging in southern Africa (Hocking 1987a).

By the turn of the nineteenth century, there were scores of cardboard box makers in Cape Town, and on the Reef. In 1910 the newly formed Government of the Union of South Africa set up a commission to investigate the extent and nature of manufacturing in South Africa. Among those who gave evidence were Mr W.E. Laughton, Paper Bag Maker, and Messrs Weinberg Brothers, cardboard box makers of Cape Town. At this time paper packaging manufacturers such as Laughton and Weinberg relied on imported paper and board, and Mr Weinberg "doubted whether paper could be made in South Africa, even with special protection" (Hocking 1987a).

In 1920, a new company was launched by immigrant, John Herzberg. The Company, (Herzberg Limited Erect Boxmakers of Cape Town) together with Oscar Fruman's Transvaal Box Manufacturers, and Willie Kalmanson's Universal Cardboard and Box Corporation, were the early forerunners of what we know today as Nampak.

In 1933, two Port Elizabeth firms began to produce multiwall paper sacks for cement packaging. One of the companies, Kohler Brothers, was to become a major packaging producer.

In the early days, boxes were made by hand. Sheets of cardboard were cut to size with the help of a ruler and knife, and the pieces were stapled or glued together. In Cape Town in the 1920s, the workforce was largely made up of women, who worked long hours for piece rates (Hocking 1987a).

The packaging industry grew and diversified along with the growth of the South African economy. In the post World War 11 years, in particular, the industry expanded rapidly, with new factories opening almost every year in the 1950s.

During the 1970s and '80s, the packaging industry became increasingly concentrated, and is now dominated by a few large companies.

The manufacture of other converted paper products, such as tissue products and printed articles, followed a similar history. Commercial printing in South Africa was established as early as packaging, and it grew in various forms (newspaper printing, book printing and commercial printing), throughout the nineteenth century. By 1939, when Sappi's first paper

mill began to sell domestically produced paper, local printers were already well organised. At first they resisted the entry of local paper onto the market. But the relationship between the local paper industry and the printers grew, and by the time Sappi launched its printers award in 1979, the industry was already largely reliant on local printing papers.

Local tissue production began a little later than the other converting industries. In 1948, Cellulose Products opened its doors, and started to produce tissue wadding. This company was the fore-runner of the Carlton Paper Corporation. Other tissue manufacturers included Amalgamated Packaging Industries and Cosmos. API and Cosmos later became Nampak tissue.

By the late 1980s, paper converting of all kinds was well established in South Africa.

4C.2 The current size of the paper converting industries

The manufacturers of paper products are often referred to as 'converters', because they convert paper into paper products. Paper converting covers a number of sectors including paper packaging, tissue products, printing and publishing.[50]

The paper converting industries' collective share of manufacturing production grew marginally in the 1980s to reach 4.5% by 1990.[51] Share of employment in manufacturing grew from 4.5% to 4.9%. This was largely a result of expanding employment in printing and publishing. Capital stock declined slightly in real terms. The capital:labour ratio thus declined, in contrast to the rest of manufacturing.

A total of 70 900 people were employed in paper converting in 1990, 67% of them in printing and publishing. R1 624m was invested in capital stock in 1990, 71% of which was in printing and publishing.

The paper converting industries meet 93% of local demand, with the remaining 7% being met by imports. This proportion is lowest in printing and publishing however, where imports account for 15% of local demand. Converted paper imports were worth almost one billion Rand in 1990.

Exports from the sector are marginal at 2% of production.

[50]What I have termed 'paper converting' covers four sectors of the International Standard Industrial Classification (ISIC.) These are ISIC 3412, 3419 and 3420.

[51]Data drawn from IDC 1992a, 1992b, and 1992c.

Output per worker increased between 1972 and 1990, especially after 1985. Real salaries and wages hardly increased during that period, and the real unit labour cost thus declined slightly.

It is evident from the above that the paper converting sector differs in important ways from the pulp, paper and board sector. Converting is a much more labour-intensive sector. In pulp, paper and board, R166 955 is invested in capital stock for each employee. In converting R22 905 is invested per employee. Paper converting is also much less export oriented – 2% of production is directly exported,[52] versus 26% in pulp, paper and board.

The growth of local paper and board consumption is closely linked to the converting industries. Growth in the converting industries, in turn, is linked to GDP. Local consumption of converted products such as toilet and facial tissue, disposable personal hygiene products, paper stationary and notebooks, newspapers, magazines and books, is expected to increase at a slightly higher rate than GDP in the next decade. Consumption is expected to receive a boost from expansion in education, and from a national housing program.

4C.3 The competitiveness of the paper converting industries

The international competitiveness of the converting industries cannot simply be measured by trade performance. This is because most converted paper products are insignificantly traded on the world market. There are a number of reasons for this. The first is that certain converted products, such as newspapers, are produced for immediate distribution. The time lapse associated with trade cannot be accommodated. The second major reason is that many converted products have a high volume to value ratio. In other words the products are bulky, and the cost of transportation is not justified by the value of the product. This problem affects products such as toilet and facial tissue, and empty corrugated packaging. This problem does not apply to all converted products – high quality books, for example, are more heavily traded.

Improving productivity and quality in production, are currently important concerns in the converting industries, especially those who manufacture paper packaging, and tissue products. Given the high labour intensity of their processes, and the fact that they operate in consumer markets, productivity and quality must be on the agenda in the long term, and are unlikely to be passing fads. Two of the major converting companies have embarked on quality management processes of one type or another in recent years.

The competitiveness of the various converted product industries will be discussed below. I will argue that, in general, we are uncompetitive in relation to the international industry. This lack of competitiveness is caused by two major factors:

[52]There is substantial indirect export of paper packaging, such as corrugated boxes in which a variety of goods are exported.

The first important factor is the paper price paid by local converters. The second is the efficiency of the packaging producers themselves.

The cost of paper comprises a large proportion of the final cost of producing paper products. The performance of the paper products industries is therefore heavily reliant on the price of paper in the domestic market.

There are two factors which influence the price of paper. The first is the cost of producing packaging paper and board locally, and the second is the price which paper makers charge to converters. The *cost* of producing paper, as we have seen above, is potentially low, on an international scale, because of South Africa's low fibre prices. This potential is, however, compromised by inefficient production.

The *price* paid by local paper converters is partly a reflection of the real cost of producing paper, but it is partly a reflection of other factors, notably import tariffs. Waste-based packaging board, solid bleached sulphate board, kraft paper, sack paper and fluting are currently all subject to a 10% import tariff. This has an important impact on prices. Any rational producer will sell his/her product at the price which the market can bear. That price is influenced by the price of the alternative product. There are two sources of alternative products — imports, and the products of a rival local company.

Let us deal with locally produced alternatives first. Since there are only two producers of virgin papers in the country, the level of competition in the local market is low. In some segments of the market, there is only one producer — as in the cases of folding carton board, and coated papers. For other packaging material, such as corrugating paper, there are two local producers. Given this limited local competition, A practise of price leadership is almost inevitable.

Imports are the second source of competition. The price of imported paper is influenced by a number of factors, including the cost of producing paper internationally, the exchange rate, the cost of transporting paper to South Africa, and the import tariff payable at the docks. The price of imported paper will thus reflect costs which are not borne by local producers. However, when local producers are competing with imports, they may be able to charge prices which are at parity with the imports without suffering any loss of market share. This practise is known as import parity pricing.

In a situation where there is a 10% import tariff, and freight charges are an additional 10%, the import parity price of local paper will be around 20% higher than the market price under competitive conditions.

As a result, it is possible for local producers to charge prices for local paper, that are higher than the average prevailing world market price. This situation has an important impact on the local converter. South African corrugated box manufacturers, for example, estimate that

their costs of paper are usually 10–15% above those of their international competitors (Interview, Transvaal 1992, interview Natal 1993).

Import parity paper prices must impact on the competitiveness of the converting industries.

This is only one part of the story, however. The competitiveness of the local packaging manufacturers is not only influenced by the price of their raw materials, but also by their own level of efficiency. As with the pulp, paper and board industry, efficiency is influenced by a number of factors. In this case the state of capital equipment, and the efficiency of the production process are the most important variables.

With regard to the state of capital equipment, the paper products industry is highly uneven. Modern capital equipment and cutting edge technology can be found in some paper packaging plants in South Africa. In others, however, a lack of investment in plant and equipment, has resulted in the ongoing use of outdated machinery and systems. This is particularly so in the corrugated and sacks sector. The more advanced plants tend to be those located at the coast, which produce packaging for products destined for the export market. Corrugated packaging for fruit exports, for example, is produced at the more efficient corrugated plants, and has a reputation for high quality standards.

The overall competitiveness of the various converting industries is described below:

4C.4 Paper packaging

Paper packaging is one component of the R7.4b packaging industry in South Africa. Packaging materials include glass, plastic and metal as well as paper. Output of the packaging industry as a whole grew by an average of 5.5% per annum between 1960 and 1990, with growth slowing to just under 3% per annum in the 1980s. This rate of growth is almost double that of GDP between 1960 and 1990.

Paper packaging is an important component of the overall packaging industry. Paper-based packaging comprised 38% of the value of output, and 40% of the volume of output of the packaging industry in 1991 (Harrod 1991).

Paper packaging has important linkages back to the paper and board industry – 48% of all paper produced in South Africa is converted into packaging. It also has important linkages throughout the economy – virtually every sector makes use of some form of packaging. The role of packaging in exports is especially important.

The bulk of paper packaging is comprised of three segments – corrugated boxes, paper sacks and folding cartons. Corrugated boxes has the largest proportion of turnover at 49%. Cartonboard represents another 36% of the market, and paper sacks a further 9% (Harrod 1991).

Paper packaging has come under threat from other materials, to some extent. In the last three decades, plastic has been the fastest growing packaging material, and now has a 29.5% share of the value of the packaging market. Paper has grown more slowly, but is expected to continue to be the dominant packaging material in the foreseeable future.

Paper packaging is a highly concentrated industry. The three largest companies together represent 57% of the market, in value terms. The next 15 biggest producers control 23% of the market, and the remaining 20% is controlled by many more smaller companies (Harrod 1991).

There is a history of highly conflictual industrial relations in paper packaging. The industry has experienced protracted strikes and stoppages. Some companies have responded in highly repressive ways. In one case, the company was found to be 'bugging' the Union office during a strike.

Like in the paper industry, wages are determined at plant, and not national level. This has been the source of bitter conflict, particularly in the corrugated packaging industry. The issue remains unresolved, although the parties are now investigating ways of reaching a common position.

The competitiveness of the industry

For corrugated boxes, paper sacks and folding cartons, the cost of paper is around 65% of the final product cost. The quality of the paper is also critical to the final product. This is an area, then, where South Africa has the potential to translate favourable fibre costs and high quality paper, into relatively cheap, high quality converted goods.

The South African corrugated box industry is at the heart of the paper packaging industry. It services almost every sector of manufacturing, and plays an important role in making sure that South African exports reach their destination in one piece. The design of corrugated boxes, and the responsiveness of manufacturers to customer requirements is widely seen as being of a high standard. In addition, the corrugated industry is a major producer and user of recycled paper. The use of recycled fibre in corrugated packaging is in line with international trends. Corrugated manufacture is highly competitive. There are twelve major converters, and the role of small companies has increased in recent years.

There is relatively little trade in corrugated boxes. Unlike the pulp and paper manufacturers therefore, the industry has been fairly isolated from the need to compete with the best international producers. Imports of finished boxes into the country are almost non-existent.

Box manufacturers, do, however, face changing pressures in the local market. Manufacturers of consumer goods, for example, now frequently demand just-in-time deliveries, as they attempt to lower their stock levels. There are also demands for greater design and graphic quality in corrugated boxes, as retailers have begun to use boxes as marketing tools. In

addition, there are pressures which come from the international market, either via local producers of goods for export, or via subsidiaries of transnational corporations. A box manufacturer gave the following example:

"The big threat for us from the international industry, is not so much the import of empty boxes, but the requirements of our export oriented customers. For example, we have a big order from a company which exports soap products. They are part of a large international company. When the guys in Europe say 'We want the boxes to look like X and we want them to have Y environmental features', the South African company must comply. They can't turn around and say 'Well, our box makers can't do it'. So, we have to be world class in order to service certain large customers" (Interview, Johannesburg 1993).

It is important, then, that South African paper packaging producers are internationally competitive, because they impact on local exporters of a range of other products. The price of packaging also influences the cost of products for the local market. If local corrugated packaging is unduly expensive, or of a poor quality, a wide range of products will be effected. It is important then, that the paper packaging industry is as efficient and attentive to quality as the best producers in the world.

It is also possible to export a proportion of paper packaging production. Corrugated box manufacturers have found some export opportunities for finished boxes. Two of the larger manufacturers have secured regular contracts to export boxes to a variety of destinations including Latin America, and the Middle East. At present, these two companies currently export between 5% and 10% of their total output.

These exports are possible for two major reasons. The first is that South African kraft paper and fluting is of a high quality, and this provides good raw material for box manufacturers. The second is that South African box manufacturers are highly skilled in certain areas — such as the design of boxes for fruit and other agricultural products. "We are exporting expertise," said one, "not corrugated boxes" (Interview, Transvaal, 1992).

This suggests that the corrugated industry may, in the long term, grow through exporting, despite the bulk problem associated with exporting boxes. Certain countries, such as Hungary, have experienced success in this regard.

The idea of exporting packaging is an attractive one, because boxes are a value-added product, and represent a benefication of our kraft paper production. At present, however, corrugated exports are quite heavily reliant on export incentives, and may not be sustainable in the long term.

The situation for paper sacks is quite similar to the position of the corrugated industry. Multiwall paper sacks are used to package a variety of heavy, dry goods, such as cement and sugar. The direct export of paper sacks is easier than the direct export of corrugated boxes,

because sacks are less bulky, and have a higher value: volume ratio. At present, 5-8% of paper sack production is exported.

Folding cartons are also an important sector of paper packaging. Cartons are used to package a wide variety of goods including detergents, cigarettes, pharmaceuticals, and a wide variety of foodstuffs. There are two types of folding cartons – those which are made from a waste-based board, and those which are made from 'virgin' board.

The waste-based board is made up of a thick layer of recycled waste, covered with a thinner layer of 'virgin' paper. The top layer must be of a high quality in order to allow for printing. Waste-based board is manufactured in South Africa. The quality of local board has, however, been a source of great concern to folding carton converters in recent years, especially in the Transvaal. The converters maintain that the quality of the board is inconsistent, and creates a range of problems on the printing machines. They also complain of long lead times, and poor service. Since there is only one local supplier of the board, and a 10% tariff on imports, converters feel trapped in a difficult situation. In 1991/2 a number of large converters began to import a proportion of their requirement. They argued that while they do not wish to abandon local papers, they do wish to keep the local mills on their toes. Some improvements in the board quality have been noted in recent months, partly as a result of a large capital investment in a local board mill.

The 'virgin' packaging board used in South Africa is usually solid bleached sulphate board which is not manufactured in this country, and must be imported. In 1992, the Board of Trade and Tariffs introduced a 10% tariff on solid bleached sulphate board, despite the fact that it is not produced in this country. Tariff rebates are available if the board is used for packaging food, but other products, such as pharmaceutical, cosmetics, and cigarettes must bear the cost of the tariff. This is seen as unnecessarily inflationary by the carton manufacturers and their customers.

The competitive position of the manufacturers of both waste-based and 'virgin' folding cartons is constrained by the board problems discussed above. South African converters have a good reputation for product design, however, and the capital equipment in the industry is generally of a high standard.

Only about 2% of folding carton manufacture is exported at present. Converters believe, however, that greater scope exists for exports, particularly in the Southern African region.

Even with relatively advanced capital equipment, however, the local packaging industry suffers from serious inefficiencies. This is illustrated below, by a comparison of a series of South African corrugated box plants, with an efficient plant in Europe.

For convenience the South African plants will be referred to as Safbox, and the European plant as Eurobox. A number of parameters will be compared, and the differences between the South African and European performance will be analysed.

	Safbox	Eurobox
Plant Utilisation	72%	94%
Unplanned downtime	14%	8%
Raw material yield	82%	90%
Person hours per ton	23	15

The five parameters measured above are all critical to the performance of a plant. All bear directly on the efficiency and profitability of an operation. The comparison demonstrates that South African plants are considerably behind the highly efficient European producer.

What do these various parameters mean?

Firstly, the South African plants demonstrate low levels of plant utilisation, and high levels of unplanned downtime. This indicates that the Safbox plants do not make optimal use of their machinery.

The high levels of unplanned downtime are a particular source of concern, because they indicate an inability to use the equipment to its maximum benefit, and point to a high degree of unpredictability in the process. Downtime erodes a plant's profitability significantly, because capital is being spent to run the plant, but no value is being created.

Safbox plants also demonstrate lower levels of raw material yield. This means that a significant proportion of the raw material which is brought in is wasted. This too is a costly practise.

Thirdly, the Safbox plants use considerably more labour to produce a ton of product, than the Eurobox plant. This too, impacts on the efficiency of the process.

Finally, the Safbox producers use 35% more labour per ton that the European plant. In summary, the South African producers use more people, to create less value.

Why do these inefficiencies occur? In this case there are three main reasons. One is the nature of the capital equipment. Some of the Safbox plants included in the average are old, and this lowers efficiencies significantly. Secondly, the Safbox plants tend to produce smaller batches of each box, because the local market is smaller and more fragmented. Thirdly, as in the case of the pulp mills (see Chapter 4B) our lower levels of efficiency are partly linked to low skill levels and poor work organisation. Since these problems are also experienced in the tissue and disposables industry, they are discussed at the end of the next section.

4C.5 Tissue and disposable products

This segment of paper converting is made up of a variety of products, including domestic and commercial tissue products, baby diapers, 'feminine hygiene' products, and disposable medical products.

Tissue paper, like other grades of paper, is produced in reels on a paper machine. In South Africa, reels of tissue paper are produced by fine paper producers, and by the converters themselves.

The conversion of large reels of tissue paper into tissue products is a relatively labour intensive process.

Like packaging, this industry is highly concentrated. There are two major tissue converters, who together control around 85% of the tissue market. They face some competition from small, waste-based local producers, and from a medium sized producers in neighbouring countries such as Swaziland. The situation in the diaper and sanitary products market is similar. Three companies control close to 100% of the market.

The competitiveness of the industry

There is very little international trade of converted tissue products, because of the high volume:value ratio. There is however, more trade in unfinished tissue paper, and in disposable products, such as baby diapers, which are more dense, and more valuable, than tissue.

South Africa does not import any unfinished tissue in reel form. We export a limited amount — 12% of production in 1991 (PPI 1992). Imports of tissue and disposable products are very limited. At the lower value end (waste-based tissue products) imports are estimated at 5% of the market, and at the higher value end (speciality serviettes and diapers) imports account for 2—3% of the market.

Similarly, we export very little in the way of converted tissue products — currently about 2% of production. We also export very little in the way of disposable products, despite the fact that there is more trade in those products. This situation is partly a result of the lisencing agreements which South African producers have with international firms. These agreements limit the export of products made here under license.

In terms of the productive competitiveness of the industry, there are various factors which need to be mentioned. The first factor has to do with the price of the converters' raw materials — in this case, pulp or tissue paper. On average, raw materials comprise 60% of the converters' costs for tissue and disposable products. As with paper packaging, the local price of pulp or tissue paper is affected by the relative lack of competition, and the cost of imports. Pulp is available from both major pulp manufacturers, and does not carry an import

duty. Tissue paper, however, is only produced by one of the major paper producers, and imports of tissue paper carry a 10% import tariff. The price that the local tissue and disposable product converters pay for their raw materials is therefore somewhat inflated when compared with the international situation.

The problem of raw material pricing is however, offset by the fact that the major tissue converters manufacture some of their own tissue paper from waste. The price of raw materials which are bought in, is therefore less of a problem in this segment of paper converting, than it is in paper packaging (or, as we shall see, in printing and publishing).

With regard to capital equipment, the industry is, on the whole, quite competitive. This is partly because the major producers all have licensing agreements with leading international producers of tissue and converted products. There are advantages and disadvantages to this situation. The advantages are that the local companies have access to cutting edge technology, without having to invest large amounts of money in research and development for technological innovation. The agreements also give local producers access to new systems and product development. The disadvantage is that our producers are locked into a dependent relationship with international companies. This discourages local innovation, and places limits on, for example, our exports. On balance, given that this sector is dominated by a few firms internationally, and that a small independent firm is unlikely to compete effectively with these giants, it seems that licensing is the best option open to South African producers at present.

As in most of the paper sector, capital equipment is all imported.

There are two major factors which compromise the efficiency of the industry. Both have precedents in the paper and packaging sector.

The first reason is that our markets are small and fragmented, and as a result, the tissue and disposable factories are forced to produce small runs of a wide variety of products. The small economies of scale and scope, lead to high levels of machine downtime.

The second reason for our relative inefficiency is the now familiar production process inefficiency. I do not have access to factory comparisons which would allow me to demonstrate this. However, there is much anecdotal evidence which points in inefficiency. One of the major converters made the following observation:

"In America they can run a machine with 5 people, and we need thirty people for the same machine. Its their education, their skills and the way they work together that makes the difference" (Interview, Transvaal, 1992).

Problems with efficiency and quality are also suggested by a recent controversy over the import of baby diapers from Israel. An Israeli company began to export diapers to South Africa in 1992. The product had a reputation for fewer defects and better performance than

the local diapers. The selling price was also 37% cheaper than the local product, despite a 35% import tariff. A local manufacturer, through the courts, was able to put a stop to the imports, apparently through a piece of "xenophobic" patent legislation designed during the mid-'80s in response to sanctions (Sidley 1992).

All the major tissue and disposable producers are concerned about the quality of their products. Regular customer complaints are received by both the major companies. The pattern of complaints indicates that a wide variety of defects are not picked up by the quality control systems. Companies are also concerned about the levels of waste in the production process.

In line with trends in paper converting as a whole, the major tissue and disposable companies have embarked upon quality management programs. Some of these programs are extremely ambitious. One manufacturer describes his aims as follows:

"By the year 2000, we will have 35% fewer people, and none of them will be unskilled. Everyone in the Company will have at least a matric plus two years training. Our turnover and profits will be four times what they are now. That's our dream. That's our vision 2000" (Interview, Transvaal, 1992).

Total Quality programs in the industry are discussed below.

Responding to the problems — total quality management programs in packaging, tissue and disposables

The total quality management programs which have been set up by companies in the packaging and tissue and disposable industries are primarily a response to problems of quality and inefficiency.

The programs have involved three main elements — training, quality awareness and co-operation.

A number of individual companies have introduced or expanded systematic training programs for production workers. According to one training manager: "In the past, we barely used to train people. We'd just show the guy — 'this is the machine, this is what you do, now do it'. Even when we bought a machine from overseas, the supplier would instruct a few guys and give us a manual, then, that was it. The lack of training in this industry is chronic — its almost a crime against humanity" (Interview, Johannesburg, 1993).

Higher levels of training are to be welcomed. They should have the effect of improving efficiencies, and providing career opportunities for workers. At present, however, training programs are highly uneven within and between companies. This means that the quality of training differs, and that workers do not receive portable certification. At present, programs do not provide clear career paths, and tend not to reward workers for higher skill levels.

Many training programs also rely on foremen selecting workers for training, and this is widely perceived as being open to discrimination. Since literacy levels are not always addressed as part of training, the programs effectively exclude illiterate workers.

The second key component of the total quality programs has been quality awareness. This takes various forms, from a general media campaign in the mill, to in-depth quality training.

The third major component of the various programs is an attempt to develop greater co-operation between workers themselves, and between workers and managers, on the shop floor. Programs aim to achieve higher levels of participation from the workforce. A popular method of achieving this has been the hosting of 'value-sharing workshops'. These workshops are designed on the (probably correct) assumption that racial and political barriers prevent the development of a common vision, and therefore, greater co-operation, on the shop floor. In order to address this problem, workers and managers are asked to spend a weekend together, developing a set of shared values as company employees. When they return to work, it is hoped that they will adhere to the values, develop greater loyalty to the company, and therefore co-operate more effectively in production.

The co-operation and quality awareness programs are, in general, to be welcomed. They indicate an awareness of real problems on the shopfloor, and are an attempt to address these. However, all of the programs in place have run into serious difficulties. The difficulties have manifested both on the shopfloor, and in conflict between the national trade union and the national management structures. There were, I believe, three major reasons for these problems:

The first reason is that the trade unions were inadequately consulted, and the role of trade unions in these programs was largely ignored. In fact, the way in which the programs were run had the effect of side-lining trade union structures, rather than building the role of the trade union as key to a program of increased quality and efficiency. While shop stewards were usually consulted at a plant level, the national trade union was not, despite the fact that the programs were implemented nationally, and that they had serious implications for the role of the unions. This led workers to suspect that the programs were partly an attempt to destroy their union. In the context of traditional industrial relations in South Africa, this is not unreasonable. All the major total quality initiatives have run into conflict with PPWAWU, and the status of some of these programs is now unclear.

One of the underlying reasons for this problem is that certain companies have attempted to present the company as a 'family'. All the members of the family are seen to have the same interests. This corresponds to a unitarist view of industrial relations, in which it is assumed that no inherent conflict exists in the workplace. It seems inevitable that companies which rely on a family concept for their total quality programs will run into difficulties. Not only is the family concept contrary to the experience of most workers, it also implies that there is no need for trade unions.

A more useful approach is suggested by Maller (1992), who argues that conflict and co-operation co-exist at the workplace. Participatory programs need to manage the relationship between conflict and co-operation, rather than replace conflict with co-operation.

The second major reason that the programs have run into problems, is that they did not go far enough in empowering workers. Although proponents of both programs argued that part of the idea was to empower workers to involve themselves in decision-making, the very structures that have prevented such involvement were ignored. One shop steward explained the problem as follows:

"Well after we went on the quality course, we did want to reduce waste and improve quality. But then the supervisor was still worrying about volume. We tried to reject the defect production when it came to packing, but the supervisor said 'Ry, ry (go, go) — you are here to work, you are not a quality controller'. Then we just pack rejects. Then again, if there is a problem, they don't ask you, they just instruct. They tell you that it is not your job to tell them the problem. You must just do what you are employed to do, which is carry out instructions" (Interview, Transvaal, 1992).

This may be an extreme example, but it points to a real problem. In the past, line managers have had almost unbridled power to instruct workers. Workers have found themselves in a deeply subordinate position, which is underscored by the racial and political inequality in the society. While work continues to be organised in line with the traditional hierarchies, it is unlikely that a quality production culture, which relies on co-operation, trust and open communication, will take root.

The third problem concerns workers' daily material conditions. There was a strong feeling among shop stewards interviewed, that workers will continue to mistrust management's motives when there is a high degree of inequality in wages and benefits, between workers and management. "You know, many of our members are living in shacks in the township. We are lacking money for a housing loan, or for education. My manager is driving a BMW, and yet they want us to share values with him. Workers are confused about that. They want quality production from us, but they are not prepared to offer quality employment".

And yet, many shop stewards understand the need to improve production all too well:

"The management wants a world class company. Well, it can be our aim too. But management must be prepared to co-operate with the workers hand in glove. For example, sometimes it can take them up to five days to fix a machine, because they don't ask us to help them. If we did not have so many supervisors, foremen, superintendents, department managers and managers, this company will be prosperous. We know that if this company cannot prosper we will join the unemployed. So we do want things to change . . . but that change must come from us and our union, not simply the management" (Interview, Transvaal, 1992).

The future of programs designed to enhance quality and efficiency is bleak if management and the trade unions are unable to negotiate a common basis for change.

4C.6 Printing and publishing

The printing and publishing sector of paper converting is highly diverse. It includes products such as paper stationary, business forms, magazines, books, newspapers, labels, envelopes, diaries, calenders, greetings cards and advertising materials.

There are in excess of one thousand companies involved in printing, but the sector is dominated by four or five major players.

Like paper packaging, the printing and publishing industry has important linkages to the paper sector, and to the economy as a whole. In the last decade, printing and publishing companies have used an increasing proportion of local paper in their raw material requirements. Three of the major companies reportedly shifted from using an average of 85% imported paper to using an average of 23% imported paper (*Financial Mail* 7 August 1992). The major paper imports are now in coated magazine paper (which is not produced in the country), and uncoated printing paper.

Although most finished printed goods are protected by an average 20%–25% import tariff, and some import controls, 15% of the local market's requirements were imported in 1990. These imports were largely comprised of printed books, brochures and leaflets (IDC 1992). Exports are marginal at 2% of production, and are mainly destined for Southern Africa.

The cost of paper comprises a high proportion of final cost for most products in the industry. Paper comprises 60–70% of the cost of producing paper stationary, magazines, business forms and leaflets. For high-value products such as greeting cards and glossy books, paper comprises 25–40% of final cost.

Capital equipment in the industry is overwhelmingly imported. The age and competitiveness of our equipment is uneven. At the lower end, manufacturers believe that we are in line with international trends. At the higher end however, the equipment used to print multi-colour, high value goods (such as coffee table books), is outdated.

The issue of training is important for the printing industries as a whole. Recently, the industry established a printing training college, as a result of a severe shortage of trained printers. Many employers believe that the college is "20 years too late" (Interview, Transvaal, 1993) and that the industry will suffer from skills shortages for many years to come.

Educational Publishing

The long awaited expansion of the education system is likely to lead to a rapid increase in demand for paper in South Africa. The A.N.C. has, for example, stated that it will aim to pursue a policy of one textbook per child per subject in a future education system.[53] Given that most black schoolchildren have few textbooks, this policy would increase the consumption of textbooks dramatically. This would be important for the paper industry, as, 20% of uncoated woodfree paper produced in South Africa is currently used for textbooks.[54]

Given that South Africa has a large and relatively diverse pulp and paper sector, we are unlikely to face shortages of paper if demand grows rapidly in the medium term. This contrasts with the position of some other developing countries. Zimbabwe for example, faced severe paper shortages and foreign exchange constraints in seeking to expand its education system following independence.

South Africa's paper industry is then, well placed to contribute to the expansion of the education system. However, the structure of the industry may have an adverse influence on educational expansion in a number of ways, primarily through raising the cost.

The influence of the paper price on educational books[55]

A textbook is the product of a number of different processes including writing, publishing, manufacturing and distribution. The final cost of a textbook will, therefore, reflect costs throughout the process. The overall selling price (before Value Added Tax), of an educational book in South Africa can be broken down roughly as follows:[56]

[53]John Samuel '*Educational publishing for a democratic South Africa: and African National Congress perspective*' Page 5.

[54]*Pulp and Paper International* July 1992.

[55]Information in this section is based on a survey of educational publishers conducted in 1993, and commissioned by Sached Books. My thanks to Sached for their assistance.

[56]Includes profits, excludes Value Added Tax.

Publication costs: 25%–35%

Manufacturing costs: 25%–35%

Distribution costs: 10%–15%

Retailing costs: 30%–35%

Paper costs are best understood as a proportion of manufacturing costs. The exact proportion of manufacturing costs accounted for by paper will depend on a number of factors, including the type of book being produced, and the size of the print run.

It is difficult then, to predict in general, the extent to which the price of paper will influence the final cost of producing a textbook. We can, however, predict the influence of paper costs, given certain scenarios. For example, for the original production of a long run, two colour school textbook, printed on uncoated paper, the cost of paper will account for 20%–30% of the overall manufacturing cost. When that book is reprinted, the paper proportion of costs will rise to 30–40% of overall manufacturing costs.

Based on this scenario, we could conclude that paper accounts for 15–25% of the final cost of producing a basic school textbook.

For reasons we have already explored, the cost of paper and printing in South Africa is higher than many other countries. This has led some educational publishers to print local books overseas, as the saving is large enough to influence the final price of the book. One example, is the case of an English-Zulu dictionary, which is due to be published in late 1993, primarily for use in schools. The publisher plans a long print run in a single colour. As a result the paper proportion of costs would be high, and the saving offered by printing overseas would be substantial. In fact the book could be printed in Singapore 38% cheaper than the best local quote. This amounts to a saving of R7.44 on every copy, and would justify printing the book in Singapore, despite transportation charges.

At present publishers who print outside the country do not face duty charges when they import the books back to South Africa. However, publishers who import paper but print locally must pay tariff charges to import the paper. This leads to a situation that if a publisher wishes to print on a foreign-made paper, there is an incentive to print the book outside the country to save on import duties. This practise may deprive South African printers of local business, and led one local printer to comment:

"A ridiculous situation exists in South Africa where a printer who uses imported paper must pay a duty. Yet a South African publisher can print overseas and pay no duty . . . How can we compete if local publishers can print on cheaper paper in Hong Kong, and not pay duty? My proposal is that if a book or magazine originates in South Africa, then duty must be paid, to level the playing field" (Interview, Transvaal, 1993).

Tariff policy on imported books

In addition to the tariff dispute discussed above, there has much controversy with regard to tariff protection on imported books. In 1993, the Printing Industries Federation requested that the state introduce of a 20% tariff on all imported books, whether they originated in South Africa or not. The proposal was fiercely opposed by publishers and educational bodies, and in response, the Board of Trade and Tariffs has agreed to shelve the proposed tariff.

Such a tariff would have resulted in a substantial increase in the cost of books. It would not, however, have tackled the real problems facing the local printing industry. Presumably, the Printing Industries Federation was hoping that a steep tariff would have encouraged publishers to print more of their titles in South Africa, but there a two problems with this argument. Firstly, a blanket tariff of this nature would have raised the price of *all* imported books — whether they originated in South Africa (and therefore might have been printed here), or not. This simply inflates the local price of international books without promoting further printing in South Africa. Secondly, tariff protection would simply have masked the real competitive problems in the printing industry — including the cost of paper. What the printing industries need, rather than an indefinite, blanket tariff on imports, is a national programme to improve their competitive position. One aspect of this would be to attempt to lower the price that printers pay for locally produced papers. Other elements would include the need for large-scale capital investment, and efficiency improvement procedures. It may be advisable to offer limited and selective protection to printers while such a programme is carried out. But in deciding on tariff policy in this particular sub-sector, the interests of consumers, as well as workers and the industry itself, must be taken into account.

Paper Stationary

The paper stationary industry also has an important link to education. The demand for scholastic notebooks, for example, is likely to rise sharply with an increase in the availability of education.

The paper stationary market is estimated to be worth around R1000m. There are some 1500 stationary retailers in South Africa and some 20 stationary manufacturers. The largest, controls around 40% of the market.

Exports are small (around 3% of production) and imports account for around 5% of the market.

The state is a major consumer of paper-based stationary, as are large retail chains (who sell a range of converted stationary products, often under their own brand names).

In the past, white education departments have been significant consumers, through their policy of providing school notebooks to white schools. More recently the Department of Education and Training, which is responsible for black education was included in this

practise. The tender for scholastic notebooks has traditionally been shared between three converters, two of which are closely tied to institutions of Afrikaans capital.

With the development of 'Model-C' schools however, the state has largely withdrawn from the provision of stationary to predominantly white schools. There are also plans for the state withdrawing stationary provision from the "Coloured and Indian" schools. The withdrawal of the state as a large consumer serves to fragment the market, and opens some opportunity for small converters. At the same time, the unit cost of paper stationary items is likely to rise.

The now familiar issue of the cost of paper raw materials surfaces in this industry too. According to one of the large manufacturers:

"Our paper is totally overpriced. Virtually every grade I need I could import cheaper, if it wasn't for the tariff. In some cases a landed import is 20–30% cheaper than the local stuff. Local prices are competitive only through protection. They're trying to keep the overseas producers out of the market. The other ironic thing is that when I'm using a paper for export, I get a special price from the producer. So I can land certain products cheaper in a foreign country, than I can in Johannesburg" (Interview, Transvaal, 1992).

Players in the industry see the emerging southern and central African markets as a potential growth opportunity, because many African countries lack adequate capacity for both paper production and stationary conversion.

The industry does not see itself as able to compete in the highly sophisticated international markets, because of its small product range, and relatively inefficient production.

At present, the paper stationary market is protected by a 20% average tariff rate. The industry will need to improve its efficiencies, if it is to compete successfully in the long term, under a lower level of protection.

Paper, printing and future educational expansion

We have seen that the price of paper has an important influence on the cost of educational books and stationary. The cost and quality of printing has a similar effect. We can therefore conclude that developments in the paper and printing industries will have an important influence on the cost of educational expansion in South Africa. If we were able to lower the cost of paper to local printers, a substantial saving could be made, inter alia, by the education system.

This point illustrates the need for a close linkage between educational and industrial strategies at a national level.

5A Competitive and developmental problems in the paper sector

So far, we have addressed a series of themes. We discussed the need for sustained economic development which addresses present inequalities in South Africa. We noted the potential role of the paper sector in that development. We surveyed the international trends in the paper industries. We witnessed the problems and inefficiencies which threaten, or constrain the performance of the forestry, paper and converting industries in the current international context. We noted the conflicts between those who control the forests, mills and factories on the one hand, and organised labour, consumers and environmental groups on the other.

What we have then, are a series of challenges to the present framework in which the industry operates. Some of those challenges are primarily problems of competitiveness and efficiency. Others are primarily issues of inclusive, sustainable economic development. Some of the issues, such as training, are problems of both competitiveness and development.

In this chapter, I will summarise the competitive and developmental problems, and then go on to suggest possible ways of addressing them.

5A.1 Problems of competitiveness

The international competitiveness of the South African forestry, paper and converting sectors can be described as follows:

With regard to domestic production, we are most competitive at the lower end of the value scale. We are more competitive in producing pulpwood, pulpwood chips, pulp, newsprint and kraft paper; and less competitive in producing printing and writing papers and converted paper products such as packaging, disposables and printed articles.

Although this pattern is not *only* important in relation to international trade, it is partly reflected in the balance of trade. Imports and exports for the paper sector as a whole are illustrated on the following page:

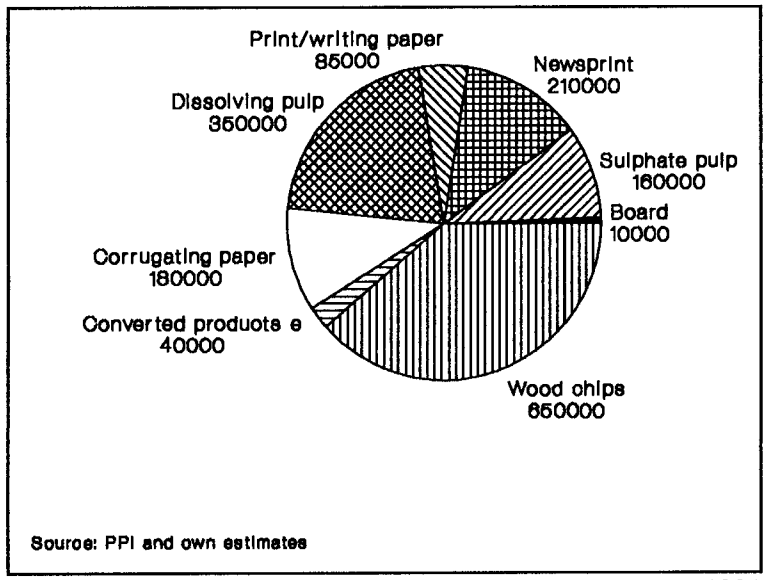

Figure 9 South African paper sector exports by volume, 1991

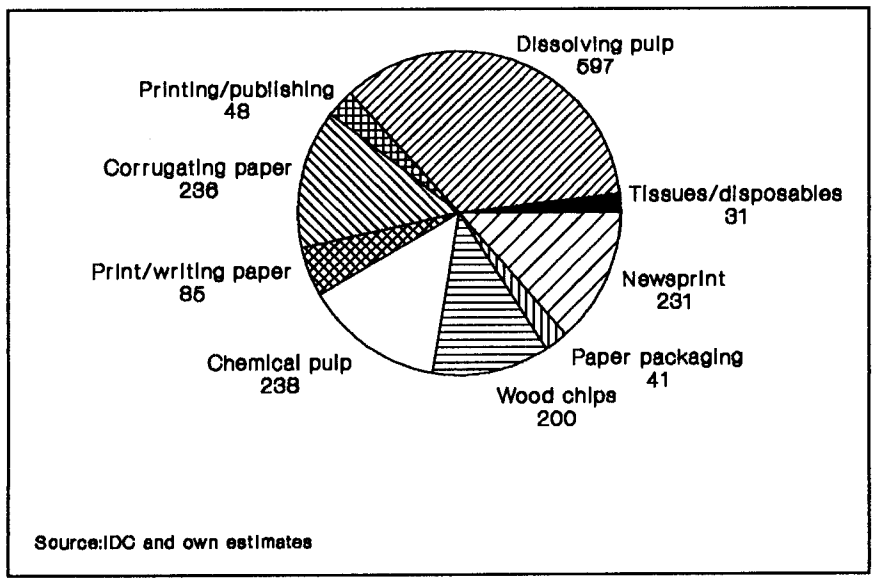

Figure 10 South African paper sector exports by value 1990

These figures illustrate that our greatest capacity and competitiveness, are in woodchips, pulp, newsprint and corrugating papers. These products are the most resource intensive in the paper pipeline. They are all commodities which are subject to the international market and to volatile cyclical price movements. They also all require relatively less manufacturing intensity, and are produced in bulk in a dedicated process. As such they require limited customer service.

As we ascend the value scale into printing and writing paper, and converted paper products, we become less competitive and less export oriented. The products at the higher end require relatively more manufacturing intensity, design, customer service and flexibility in response to changing conditions.

To summarise our present position then – the South African paper sector relies primarily on low pulpwood costs to produce and export the commodity grades. We produce a relatively wide range of higher value fine papers (including printing and writing papers), but these are mostly for the local market which enjoys substantial protection from imports.

Our manufacture of converted paper products such as packaging, disposables, printed goods and stationary is not world class, and exports of these products are extremely small.

Why has South Africa been more successful at the lower end of the value scale?

I argue that there are four major reasons that South Africa has been more successful at the lower end:

1. Manufacturing inefficiency prevents us from taking full advantage of our raw material benefits, and constrains our performance at every stage of the paper pipeline.

2. Some of the technology and capital equipment which is used in the sector is outdated. This is particularly true in the converting industries.

3. Present pricing arrangements prevent our raw material advantages from being passed along down pipeline to downstream producers.

4. Our domestic and regional markets are small and fragmented, and the impact of this is to discourage economies of scale and scope. In certain areas, notably fine papers, mills produce a wide variety of products, thus lowering efficiencies. This is done under the protection of tariff barriers.

A recurring theme: Production inefficiency, work organisation and skills training

Throughout the study we have seen problems which are related to production process inefficiency. There are efficiency problems throughout the sector. Why is this the case? I argue that there are two main reasons. The first is poor work organisation, and the second is inadequate skills and training.

Work organisation must ultimately be assessed on a plant-by-plant basis. However, certain common problems have emerged.

- Most plants run according to long hierarchies, strict job demarcations and rigid lines of authority. Although these are formally based on skill, they often co-incide with

racial divisions. These rigidities seriously impede communication, and make problem solving and flexibility difficult. Workers' tacit skills are not recognised or tapped, and many workers are locked into menial task-oriented jobs, rather than responsible jobs which encourage conceptual work.

- There are stark differences in benefits and living conditions enjoyed by (largely black) 'unskilled' and semi-skilled workers on the one hand, and (largely white) skilled workers and managers on the other. These encourage conflict and constrain co-operation.

These factors are linked to a history of serious industrial conflict in the industry. The pulp, paper and board, and converting industries have all experienced long and damaging strikes in recent years. If conflict is to be avoided, or at least managed more productively, relationships on the shop floor will have to change.

Some companies have tried to address the problems of conflict and low productivity through various forms of total quality management. There are, however, two major problems with the schemes as they exist at present. Either the schemes exist 'in spirit' only, and mean very little to the actual process of production, or they have been implemented in a way which alienates workers and their trade unions, and stops short of addressing the roots of conflict and inefficiency.

The second set of problems relating to production process inefficiency has to do with levels of skills and training. We have noted in the various sub-sectors, that skill levels are low in comparison to international best practise. There are the common problems throughout the sector with regard to addressing skills constraints:

- Training which exists in the sector is fairly coherent at the level of artisan formal education, and is co-ordinated by various industry bodies. The relatively small numbers of artisans being produced is of concern, but efforts are being made to increase these numbers, especially in the pulp, paper and board industries, and in printing and packaging.

At the level of production workers however, there is no coherent national training system, and there is a serious skills shortage. One indication of the skills shortage is the literacy problem experienced in many mills. Although comprehensive literacy figures are not available, it is my estimate[57] that 35–40% of workers in this sector (including forestry workers), are illiterate. This presents a serious problem with regard to both training and worker empowerment.

- A number of training problems hinge on the fact that existing training schemes tend to rely on ad hoc on-the-job training, rather than systematic, formal training. A

[57]This estimate is based on data provided by companies that do track literacy levels.

number of companies, particularly in pulp, paper and board have recognised this problem and are attempting to tackle it. Certain companies have launched ambitious training programs which aim to develop a more systematic approach to training, and to provide workers with certification. Others have attempted to design a system which allows workers to progress through a career path. However, even these efforts, commendable as they are, can be criticised on various levels:

- The schemes are still relatively small. The company, for example, which is running the largest in-house training scheme in the industry, pointed out that under its current program, it will take 20 years to make up the training backlog, and bring operators qualifications in line with international trends (Interview, Transvaal, 1993).

- With the exception of a training scheme in the printing industry, training schemes are company, rather than industry based, and therefore necessarily uneven.

- Training schemes have not been worked out in conjunction with trade unions, and in certain cases trade unions have been specifically excluded from discussions about the restructuring of training.

- The career paths which are offered are often excessively complicated and difficult to follow, partly because of the long and rigid hierarchies which exist on the floor.

- Training schemes, in general, offer no material incentives for workers to pursue training, and often expect workers to pursue training on their own time rather than company time.

- Many training schemes exclude illiterate workers as they rely on a certain literacy level, but do not link literacy training to the rest of the training path.

- In most companies, line managers select 'promising' workers for training. This gives rise to a situation where racial, political or personal discrimination is possible.

- There is no link between training, skill levels and wage renumeration.

If skills shortages are to be addressed, solutions to these problems will have to be found. It is unlikely, however, that these problems will be resolved without comprehensive industry plan, which takes account of the needs of the various players.

5A.2 Problems of inclusive and sustainable development

There is a second set of problems in the industry which concerns the impact of the industry's choices on labour and the environment. Given that this study is concerned with an inclusive and sustainable development strategy, the interests of labour and the environment must be

taken into account. These issues will also impact on the long term competitiveness of the industry.

The major problems are as follows:

- **Forestry work**: There are essentially two sets of problems – the general conditions of forest workers, and the particular conditions of sub-contracted workers.

  In general, forest workers are paid very low wages, have limited access to employment benefits, and are not protected by labour legislation. Women workers are located in particularly insecure and poorly-paid jobs.

  In addition, there has been a shift in recent years towards sub-contracting of forest work, so that by 1992 at least one third of all forestry work, and 60% of all timber harvesting was being performed by contractors. This has led to thousands of retrenchments from the larger companies. While conditions among contract workers are uneven, they are, on average, paid less, suffer more health and safety problems, have less access to benefits such as housing and health care, and have less security of employment then forest workers in the large companies. They also have less opportunity to join trade unions.

  Given that many rural areas are in serious need of secure, well-paid employment with access to education and training, the current position of forestry workers, and contract workers in particular, is unfortunate. While it is imperative that then, wood costs are contained, this will have to be achieved at the same time as dire social needs are addressed.

- **Housing**: It is sometimes imagined that workers in formal industrial employment do not live in informal housing, such as shack dwellings. I was struck, however, in my visits to various mills and factories, by the scope and urgency of the housing problem facing workers in this sector. We have already discussed the housing problems faced by forestry workers. They are not alone however. In interviews with shop stewards at the mills throughout the country, housing was consistently raised one of the workers' most serious problems. According to estimates made by shop stewards in the plants I visited, 20%–30% of union members in the sector live in informal housing.[58] It is important that further research be conducted in order to establish exact housing needs.

  The major companies all offer some housing benefits. However, these benefits often fail to reach the people who need them most. A number of mills, for example, offer

[58]A National Union of Metalworkers' (NUMSA) survey found a similar breakdown for semi-skilled african metalworkers. 29% of workers in the survey were housed in shacks or hostels.

subsidised, company-built houses to a section of their employees. But access to company housing depends on reaching a certain employment grade. Housing is routinely available to skilled workers, foremen and managers, but is usually unavailable to 'unskilled and semi-skilled' workers, despite the fact that it is these workers who are least able to afford their own homes. As one shop steward put it:

"The African workers are living in a shack settlement but our mill manager is living in a company house. The black worker's salary is not enough to buy his own house, but the manager's salary is enough. So, this is illogical – the company houses should be for those who cannot build their own house" (Interview Natal 1992).

Some of the companies allow workers to borrow money against their pension funds, or offer security to encourage workers to take home loans. This has enabled a section of the workforce to buy their own homes. However, for workers who are at the lower end of the wage scale, this is not a possibility.

There are compelling human reasons for companies in the sector to investigate ways of addressing the housing crisis for their workers. But there are also competitive reasons. Workers who live in shacks and travel hours to work every day are unlikely material for a world-class workforce which is willing to co-operate in order to make production more efficient

Environmental degradation: There are a range of environmental problems in the sector. They include issues of water usage and preservation of biological diversity in the commercial forestry sector; effluent management in pulp mills, emissions from pulp and paper mills; and the collection and recycling of paper waste.

Both environmental legislation, and public environmental pressure are limited in South Africa. As a result, companies' environmental programs will be largely driven by their own environmental concerns, or by the international market. While some companies have taken active steps to address environmental problems, it may be insufficient to rely on private initiative. What is necessary instead, is a comprehensive and transparent approach to environmental protection.

5A.3 Current industry policy for the paper sector

The state currently sets the framework in which the industry operates through various types of industrial policies. The impact of such policy is most clearly felt in the areas of trade policy, export incentives, exchange rate policy and investment incentives. These issues have been discussed throughout this study.

My overall assessment of state policy with regard to this sector is that it has had limited success in promoting competitive production. Tariffs, although nominally in line with the international average, create the space for import parity pricing, and allow local

manufacturers to limit competition. Export incentives, in their current form, reward exports that would probably occur anyway, due to the size of production runs in key areas such as pulp, dissolving pulp, newsprint and packaging paper. The General Export Incentive Scheme has not succeeded in encouraging exporters to move towards the export of value-added goods in any significant way. Similarly, investment incentives in the pulp and paper industry in particular, contribute to an extremely low tax rate without raising the volume of investment significantly.

Key state policies such as trade policy, export and investment incentives need to be revamped as part of a new strategy for the paper sector.

Chapter 5B Strategy and policy for the 1990s

An industrial strategy for the sector must be designed around a favourable *process* of policy formulation, as well as appropriate policy measures.

The process of policy formulation

There are a number of ways in which national sectoral policy could be formulated. Policy could simply be set at a national political level, and be translated into legislation. However, any comprehensive strategy would probably be more successful if it were crafted collectively by the major players in the industry.

The most likely forum in which this could be done would be a bi-partite or tri-partite industry forum. I argue that such a forum needs to be set up as soon as possible, and that this forum should address the concerns of the major players — the companies, the trade unions, and where necessary, the state. Other interests, like those of consumers and environmentalists, would also need to be represented. When necessary, such a forum could divide into sub-sectoral fora (eg: forestry; pulp and paper; packaging; tissue products; printing and publishing) in order to facilitate more detailed programmes.

There are compelling reasons for the companies and unions in the sector to agree to participate in tri-partite fora. From the companies' side, I have argued that in order to compete effectively in the longer term, companies will need to address efficiency problems, inter alia, through changing their work organisation and management of human resources. They will have to raise productivity, improve yield on plant and materials, cut waste, and improve quality. To achieve this, they will need a leaner, more skilled, and more involved workforce. They will have to find ways to improve communication and achieve co-operation. In short, companies will need a new approach to the management of the labour process and of the workforce. This in turn, will require the involvement and co-operation of workers and the major trade unions. The experience of worker participation schemes which have attempted to sideline the unions, suggests that it would be unwise to exclude unions from this process.

In seeking the co-operation of the unions, companies will need to make certain trade-offs, and move towards meeting key worker demands. The unions in turn, will need to develop a sophisticated and creative response to changing conditions. In order to win demands on issues like wages, levels of bargaining, sub-contracting and retrenchment, they too will need to make certain trade-offs.

This process of negotiation could be managed in a way which forms the basis of a new, co-operative and comprehensive approach to industrial strategy. It may be possible then, through

the mechanism of national bi-partite negotiations, to meet key worker and employer demands, and at the same time, to contribute to sustained economic development.

There are a number of areas which would need to be addressed in order to resolve the competitive, social and economic problems identified in this study. Below, I offer broad suggestion for strategic and policy direction:

Policy measures

The long term aim of the policy proposals which follow is to continue to compete, and indeed to expand our involvement, in the pulp, kraft, and newsprint markets, while developing a more competitive position in fine papers and converted products. This would mean moving away from an exclusive reliance on raw materials for competitive advantage, and towards a situation where we could enhance our position by virtue of our manufacturing competitiveness.

At the same time the aim of the strategy is to contribute towards an industrial development path which addresses present social inequalities, and protects the environment.

Achieving these aims would require a multi-faceted approach, but could include the following policy measures:

I. Aim: *Restructure the role of the state in commercial forestry*

We have seen that the state is a major forest owner as a result of its historical involvement in the development of the forestry industry. Some state policy makers believe that the state has played its "*pioneering role, but now that the private sector is involved, it is no longer necessary for the state to own forests*" (Interview, Department of Forestry, 1992). This view has led to a proposal to privatise the state forests. The proposed privatisation fits in to a well-established program of privatisation undertaken by the Nationalist Party government since 1988.

The first step in the privatisation process has been completed, with the commercialisation of the state forests in 1992. This has led to the formation of 'Safcol' — a publicly owned, but profit-seeking forestry company.

I argue that there is a case for continued state ownership of forests, but that there is a need to overhaul the state's management practises. There are a number of arguments for continued state ownership. Firstly, continued ownership would allow the state to play a strategic role in the industry, and to influence the development path of the sector as a whole. Secondly, some ownership would allow the state to protect indigenous forests, and establish higher environmental standards.

The degree of state involvement also influences pricing trends in the pulp and paper industry, and in sawmilling. We have noted that state forestry plays an important role in setting the price of softwoods, through their supplies to sawmills and pulp mills. Since the commercialisation of state forests, there have been significant softwood price increases. While this may have been necessary in order to remove a hidden subsidy, there is little doubt that Safcol's recent proposal to "bring domestic timber prices in line with the rest of the world" (Ryan 1994) is misguided. Local timber prices should not be 'in line with the rest of the world' — rather, they should reflect our natural timber advantages.

If state forest ownership is to be maintained, pricing policy must be clarified. If the state chooses to subsidise certain wood-based activities (such as low cost housing), through a discounted timber price, then that decision must become transparent. If, however, the state wishes to run the forests on a purely commercial basis, then care must be taken not to disadvantage downstream converters at the expense of high profits for the state forestry company.

Similarly, if state ownership is to be maintained, environmental practises in the state forests must be improved.

II. Aim: *Discourage wood chip exports and expand pulp and paper production*

We have noted that exports of wood chips have increased dramatically in recent years, and are set to rise further. The reason for this is that South Africa currently has a surplus of hardwood supplies, but that given the depressed levels of pulp and paper prices at present, companies are unwilling to integrate forward into pulp and paper production.

We have also noted that since it has been commercialised, the state owned forestry company has become one of the leading exporters of wood chips.

The trend towards increased wood chip exports is cause for concern. Given the opportunity costs involved in forestry, it is not in the interests of the economy to promote forestry, if wood is simply to be exported in its most basic raw material form. Further beneficiation of the wood justifies forestry's land and water usage more easily because it creates more employment and earns higher levels of foreign exchange.

In light of this it is necessary to anticipate and plan for future wood usage. Hardwood supplies are expected to continue to exceed demand in the foreseeable future. This implies that wood chip exports would continue to be viable. If and when pulp and paper prices rise, companies which are presently exporting woodchips, may invest in pulp and paper capacity, and move out of the wood chip market. But it may also be necessary to

take positive steps to encourage such investment, particularly in light of the fact that such investment would also serve to expand that part of the sector in which we are currently most competitive.

Mechanisms:

If South Africa continues to produce a surplus of wood, a number of steps could be taken to encourage forward integration and thus discourage wood chip exports. These would include:

a) Investment assistance could be provided by the state, possibly through the Industrial Development Corporation. This would be particularly applicable, since the state forestry company is one of the parties that is currently involved in wood chip exports.

b) A foreign investor could be sought to provide the necessary capital for further pulp and paper capacity. If such an investor was an established international pulp and paper producer, there may also be additional benefits for the local industry. Foreign investment has played an important role building pulp and paper capacity in comparative international cases, notably in Chile.

c) If there is no progress in the medium term, the state should consider converting some forest land to alternative land use.

III. Aim: *Ensure raw material supply, while bringing forestry in line with environmental goals.*

In light of the various environmental problems in the commercial forestry industry, further afforestation needs to be considered with caution. In addition the environmental impact of existing forest plantations, particularly those under the control of the state, needs to assessed on an ongoing basis. To this end, two policy developments can be suggested:

Mechanisms:

a) The afforestation permit system should be comprehensively reviewed by a co-operative body which includes representatives of environmental organisations. A revised permit system should take account of threats to biological diversity, and should tighten water supply regulations. In addition, the body should have powers of inspection, and should have access to sufficient resources to allow for proper monitoring of permit specifications. This process should be conducted within the guidelines of Integrated Environmental Management.

b) A forestry forum could create a forest charter, laying down minimum standards for sustainable forestry practise.

c) Given that such policies will probably limit further afforestation, new sources of raw material supply will have to be developed. One way to increase raw material supply would be to create a national recycling strategy, which aims to involve local government, industry and the public in the ongoing collection of post-consumer waste. Such a system could draw partly on the existing schemes run by the paper companies. At the same time, we will need to create more demand for recycled products, in order to avoid a glut of recycled paper on the market. This could be done partly through a national recycling awareness campaign, and partly through local or national legislation. Legislation, for example, could set minima for recycled fibre content in such products as newsprint and secondary packaging. Government departments and public organisations could also set an example by making use of recycled papers.

IV. Aim: *Improve conditions for forest labour*

We have noted above that while it is very important to maintain competitive wood costs, subcontracting, low wages and inadequate labour legislation must be challenged if forestry is to make an appropriate contribution to much needed rural development.

The challenge here is to improve forestry workers' conditions without destroying the competitiveness of our timber, or placing an unbearable burden on the forestry companies.

Mechanisms:

There are three ways in which the problems could be addressed:

a) Conditions of work differ between various forestry companies. Some companies provide comprehensive facilities and benefits on forestry estates. In the best cases these include family housing, medical care, subsidised meals, cooking facilities, childcare, primary schooling, and a contribution to secondary schooling. Other companies or state forest areas provide few facilities for their workers. Similarly, while wages are low across the board, they differ between regions and companies.

The first step would be to attempt to equalise conditions in the sector. This could be done in a number of ways. One would be to create a forestry industry forum, to be comprised of the state, the national forestry trade unions and the companies. This forum could be used to negotiate a set of minimum wages and conditions for the sector. The needs of smaller companies with less access to resources, could be a subject of negotiation.

b) It may be appropriate to subsidise the level of forestry wages, in the interests of the sector as a whole and of rural development. Again, there would be a number of ways of doing this. One would be tax exemptions for forestry workers, or even a direct state subsidy. The state's interest in this would be to assist rural development, and combat spiralling urbanisation. A second way would be to levy pulp, paper and converting employers, who all rely on the fruits of the forestry industry. For example, employers could be asked to pay an agreed levy relative to their number of employees or their profits. This money could be used to establish communal facilities for forest workers and their communities.

c) A bi-partite forestry forum could also be used to negotiate the future of sub-contracting in the forests. One of the major motivations for sub-contracting is that it allows companies greater flexibility in the organisation of work. There may, however, be alternative ways of increasing labour flexibility. New work arrangements for instance may enable companies to decrease their reliance on sub-contracting. Any contracting which remains should be subject to negotiated minimum conditions. For example, companies could insist that contractors meet a code of employment conduct before they are hired.

V. Aim: *Deflate domestic paper prices*

We have noted that paper prices in South Africa often exceed prevailing international market prices, and that this constrains the performance of the paper products sector. It is imperative that the cost of paper is lowered, so that our raw material advantage is passed down the pipeline. In this way paper converters could benefit from our natural competitive advantage, and consumers could expect lower prices on paper products.

Mechanisms:

One way to deflate local paper prices would be to increase the level of competition in the domestic market, and, in particular, to prevent import parity pricing. One method of achieving this aim is to lower tariff protection.

At present the pulp, paper, board and converted paper industries receive protection from imports through a range of import tariffs. Nominal protection (10–15% for paper and board, 15–25% for converted products) is relatively low in the South African context. The effective rate of protection is higher, however, at 19% (BTI 1992) for pulp, paper and board, and an average of 22.2% for paper and paper products (Fallon et al 1993). The protection on paper and board, in particular, has led to concern about import parity pricing, and the consequent effect on paper conversion.

Paper and board manufacturers argue that they should enjoy levels of (nominal) protection similar to those enjoyed by their major competitors internationally. This, they argue, will create a 'level playing field'. This argument was largely been accepted by the Board of Trade and Industry in the findings of its investigation into protection for the paper industry in 1992 (BTI 1992).

However, there are a number of factors that shed doubt on the 'level playing fields' argument. The degree of protection enjoyed by a domestic producer is affected by a number of factors. In addition to the rate of import protection, the degree of competition that a domestic producer faces will depend on the number of competing domestic and regional producers. The more domestic and regional producers in the market, the more the level of competition, and the less the possibility of import parity pricing. When these factors are taken into account, South African companies' position is more favourable than it appears at first glance. There is very limited competition within the South African paper and board industry. In the cases of folding carton board and coated printing and writing papers, there is only one domestic supplier. In the cases of most other paper grades there are only two suppliers. Competition from the Southern African region is very limited – there are only 3 other paper mills in the Southern African region (in Zimbabwe). These mills, and the small number of converting operations in the region, overwhelmingly serve their local markets. In addition, South Africa's geographic position provides local producers with some protection, due to the cost of transporting paper to South Africa.

This position can be contrasted with the situation faced by most international paper producers. The European Community, for example, levies a 6-9% tariff on uncoated and coated papers. However, European paper and board manufacturers not only face competition from other national producers (who are often numerous), but also from other producers within Europe, who, as members of the E.C., are not subject to any tariff barrier. The cost of transporting a product within Europe is not prohibitive. The competition faced by an average paper and board producer within Europe, therefore, is much steeper then it appears at first. The situation is similar in the USA. Tariff protection is lower than in the EC, at 1.8–3.5% (BTI1992). There are numerous paper manufacturers in the USA, as well as substantial trade with Canada. In addition, the North American Free Trade Agreement will make tariff-free trade a reality between the USA, Canada and Mexico.

The major exceptions to this trade situation are Brazil and Australia. Australia has a flat import tariff of 15% on papers, and there are a limited number of local producers. Proximity to the booming South East Asian markets, however, make regional trade a substantial factor. Brazil levies a 25% import tariff on both uncoated and coated paper, despite enjoying the lowest wood costs in the world. This situation, however, seems set to change. Import protection in general is on its way down in Brazil, partly as a result of the new Latin American common market, and partly as a result of changing state

policies. The average import tariffs are set to decrease from an average of 21% in 1992, to an average of 14% by 1994 (Alfred 1992).

Even without the arguments related to local competition, and to transport costs, South African levels of protection are still high on an international scale. The BTI argued that South Africa is in line with the international average. The international average is however, a variable number, because levels of protection are so diverse, and the average depends on which countries are included in the calculation. If Brazil and Australia are excluded from the calculation, for example, the average rate for a the USA, the EC, Japan and Sweden (all major paper and board producers), falls to 4.3%. In this case South Africa is way above the average at 10.2%.

Given this situation, I argue that import tariffs on paper and paper products in South Africa need to be reduced over a period of time. The exact level at which tariffs should be set is difficult to determine, and depends on various factors. Whatever the final number, the issue is clear in principle – that import tariffs on paper should experience downward pressure in the medium term. In addition, tariffs should be streamlined. The BTI, in its recent report, removed import controls and simplified the tariff structure for pulp and paper. This is to be welcomed, and any future protection regime should retain these features. It is also advisable to make some distinction between coated and uncoated papers.

A similar situation exists for import tariffs on converted paper products. The differential between the current South African tariff level and international levels is similar to the differential on paper and board, described above. The South African level is 15–25%, whereas the EC level, for example is 9–12%. Given that there is little international trade in some converted products (such as tissue products and corrugated boxes), there is even less need for high tariff barriers. The tariff schedule for converted products is, unlike the newly revamped paper and board schedule, very complex, and is in need of simplification. The schedule and the tariff levels need to be revamped. The tariff level itself should be lowered by around 10% in the medium term.

Having said this, however, it is important to note that if lower tariffs are to be enforced in the sector, a number of other changes should be made to the existing trade regime. Firstly, tariffs on imported capital goods should be lowered or removed. At present, paper and paper products manufacturers (along with most other manufacturers), are affected by tariffs on imported capital equipment. Capital equipment used by the industry is overwhelmingly imported, and is likely to continue to be imported. Given this fact, it is punitive for manufacturers to pay a tariff on their capital goods. Removal of such tariffs is likely to assist manufacturers in this sector, and may provide a boost to investment.

Secondly, tariffs which are levied on products not made in South Africa should be removed. At present, import tariffs apply to certain papers, such as solid bleached sulphate board and light weight coated paper, that are not produced in the country. In the

case of light weight coated paper, an uncoated substitute is available locally, but his does not meet the requirements of many printers (Financial Mail 11 September 1992). In the case of sulphate board, rebates are available when the board is used for food packaging. Manufacturers of other products which are packaged in sulphate board, however, must bear the cost of the tariff. I argue that in principle, no tariff duty should be levied on papers which are not made locally, because the tariff serves no development purpose, and is purely inflationary. If Customs and Excise is unable to identify the correct product successfully at the port of entry, then rebates should be made available.

Thirdly, it is important that the level of protection be kept as stable as possible. The need for stability is not important enough to keep tariffs at their present level, but any changes made should be as permanent as possible.

Fourthly, more effective anti-dumping measures need to be found. It is evident that in periods of international overcapacity, the volume of foreign paper entering South Africa's markets increases substantially. Up to now, increased tariff protection has been sought during cyclical downswings. However, as the Association of Paper Distributors points out, when a tariff is increased in response to cyclical price movements, it is a "long term solution to a short term problem" (Financial Mail 19 April 1991). A more appropriate solution would be to tighten up the state's anti-dumping capabilities.

In summary then, I argue for lower tariffs on paper and paper products, and more effective anti-dumping measures. These policies should increase competition in the local market. The long term effect of this will be to lower paper prices paid by converters, to increase the competitiveness of the industry, and to lower prices paid by consumers. It is understood that a sudden drop in tariffs may leave the industry too little time to adjust. Tariff reduction should therefore be phased in order to allow companies time to adjust. Such policies will provide the local industry, and the local consumer, with a truly level playing field.

VI. Aim: *Improve Human Resource Development*

We have noted above that there are serious human resource problems in the various sub-sectors, and that these constrain the performance of companies, and limit the mobility of its employees. A comprehensive human resource strategy is needed in the sector.

Mechanisms:

It will be necessary to restructure training, wage bargaining and work organisation in order to address human resource development systematically.

South African mills and converting factories need to be re-organised to promote higher levels of efficiency and quality. At the same time, it will be important to provide workers with training opportunities, create an upward long-term trend in wages, and address major conflicts in the industry. There may be one strategy which addresses all of these needs. This strategy is drawn from the Australian experience of the late 1980s, and early '90s.

The idea would be to create a national training system, which is linked to work grades. Workers would occupy particular grades, according to their level of skill, and not according to their task. The grade system would be flattened, so that a limited number of grades exist. The grades would then be linked to a national wage structure. Trade unions and management from each sub-sector would negotiate the number of grades, and the corresponding wage rates annually, at a national level.

The grade system would then be linked to a national training system. In order for a worker to progress up to higher grades, that worker would need to complete industry-wide training courses. Once a worker completes training courses, s/he should receive additional pay, if s/he is called upon to use his new skills in production.

Such a training system is currently being considered by various affiliates of the Congress of South African Trade Unions.

The twin plan of reducing the number of grades, and increasing skill levels, would have the effect of reducing rigidities in the plant, and empowering workers to involve themselves more meaningfully in production decisions. This in turn, would raise efficiency and quality levels in production, and alter the hierarchical relations on the shopfloor.

It would also resolve the centralised bargaining debate, which, as we have noted, has led to much conflict in the industry. This system would provide a type of centralised bargaining, but one which links higher wages to higher capabilities, brought about through training.

The system would also provide a real investment in developing South Africa's human resource base.

The smaller number of grades could form the basis of improved work organisation, which relies on more a more collective decision-making style, and allows for effective problem solving.

The trade unions, through their shop steward systems, would need to be incorporated in certain plant level decisions, such as who would get access to training. Major work organisation changes would also need to be negotiated with representatives of labour.

VII. Aim: *Encourage ongoing investment and exports.*

There is clearly a need for substantial investment in certain parts of the sector, notably board, fine paper, paper packaging, and sections of the printing and publishing industry. Similarly, there is a need to encourage further exports, particularly of value-added products. This could be done through the provision of investment and export incentives. We have noted, however, that past incentive schemes have been very costly, and their efficacy has been questionable. It is necessary therefore to re-structure investment and export incentives as they are applied to this sector.

Mechanism:

We have seen that investment incentives in their current, general form do not take account of the differential investment levels demanded by the different industries, or of the differential replacement intervals appropriate to different types of technology. As a result, generous investment incentives in pulp and paper industry for example, contribute to extremely low tax rates, without appreciably raising investment. Policy interventions should aim to strike a balance between encouraging investment, and maintaining a reasonable tax rate — particularly in pulp and paper.

It is therefore suggested that investment incentives need to be targeted for particular sectors or sub-sectors, rather than being general in nature.

While I do not offer a specific formula, I argue that investment incentives require some flexibility. This flexibility should allow for a different incentive structure for the various sub-sectors, and should be based on specific aims and requirements.

This however, would introduce complexity into the formulation of incentives, and efforts should be made to maintain transparency.

The situation is similar with regard to export incentives. The present general incentives do not take account of the specific conditions in the different industries or sub-sectors. The general nature of the General Export Incentive Scheme (GEIS), for example, leads to a situation where incentive payments are often made where exports would have occurred anyway, as a result of the scale of production. GEIS therefore results in large sums of public money being paid to private companies without appreciable social benefits.

I argue therefore, that export incentives should be made available on a more specific basis for example, to help 'kickstart' new exports. Such incentives could be phased out over time. One example of a sub-sector that would benefit from such a specific and limited incentive would be the printing and publishing sub-sector which currently exports very little of its product.

VIII. Aim: *Encourage local development*

We have noted above that South African pulp and paper companies have made substantial offshore investments in recent years. Since 1990, both Sappi and Mondi have bought printing and writing paper mills in Europe, and a Mondi-linked consortium has also invested in a British newsprint mill (Cole, 1993).

This raises two concerns. The first is that the companies are investing large sums in Europe, at the expense of investment in local production. Much-needed capital is thus being removed from the South African economy.

The second concern is that Sappi and Mondi are choosing to add value to local raw materials offshore rather than at home. This could deprive the local economy of employment, and lock the local industry into exporting raw materials.

The companies argue that their foreign investment is not made at the expense of local investment, and that there are certain benefits to international acquisition, including access to foreign technology, and increased foreign exchange earnings through repatriation of profits. They also argue, as we have noted above, that fine papers need to be produced close to the final market. This argument does not apply however, to the manufacture of newsprint, and there seems to be little strategic advantage for South African firms to own offshore newsprint mills.

It is important to note that there are both dangers and opportunities associated with offshore investment. These need to be understood and managed.

In this regard, it will be necessary to take action designed to discourage companies from shifting their major investments, and their value-adding activity in particular, away from South Africa. At the same time, strategic international expansion must be encouraged. Accordingly, investments made by local companies should be carefully monitored by the South African government. The place of offshore investment in an overall strategy for the pulp and paper sector should be a subject of discussion between the companies, the unions and the state.

IX. Aim: *Lower the cost of paper-based educational materials*

We have noted that in the mid-1990s there is likely to be a major expansion of the education system and of educational publishing. We have also seen that the price and quality of paper have a significant impact on educational publishing. It is therefore necessary to link an industrial strategy for the paper sector to a strategy for educational expansion.

Mechanisms:

a) Given that the cost of producing printing papers could be lowered if paper mills consistently have the opportunity to produce long runs of a limited range of papers, educational publishers could agree to use a limited range of papers for the production of various categories of textbooks. In return, paper producers would consent to discount the prices of the agreed range of papers, and to meet mutually acceptable quality requirements.

Similarly, publishers could agree to limit their use of imported papers in return for favourable pricing arrangements.

b) Publishers and manufacturers and merchants could arrange to limit the costs of paper distribution by agreeing that, with regard to a limited range of papers, mills supply directly to the printers whenever possible.

X. Aim: *Improve overall environmental protection*

In addition to the need to revise the afforestation permit system (see III above), there is a need to address wider environmental concerns throughout the sector. Protection of the environment is an area where there is greater scope for co-operation between the companies and the state.

Mechanism:

The companies, possibly in co-operation with environmental interest groups, could be asked to develop a comprehensive strategy to address environmental degradation, and this should include a program of investment in environmental protection. Legislative measures, particularly those designed to control afforestation, mill effluent and emissions should be revised, to match the highest international standards.

XI. Aim: *Act to prevent crisis in weak sub-sectors*

We have noted that there are certain sub-sectors or individual mills which are uncompetitive. These include a number of carton board and fine paper mills. These mills will have to re-structure in order to compete with imports. Such restructuring would take a number of forms depending on each mill's specific problems. Retrenchment may however, be an element of management restructuring plans in certain mills, and for this reason it is important that employers and unions are proactive in addressing competitive problems.

Mechanisms:

In order for labour to protect their members and make a meaningful input into restructuring trade unions will need to be drawn into restructuring as early as possible. Unions will also need to develop the research and policy-making capacity required to make their own restructuring proposals at individual mills.

Conclusion: Prospects for the paper sector in South Africa

The paper sector in South Africa is well placed to prosper, and to contribute to social and economic development in the long term.

In the short term however, the sector will continue to suffer from a number of problems, including the effects of international recession. If and when conditions improve in the international industry however, South African companies will, on the whole be well placed to take advantage of the upturn.

The prospects of the sector will also be influenced by political and economic developments in South Africa. If the local economy grows, and if a measure of income redistribution occurs, the paper sector will benefit directly as a result of higher levels of paper consumption. This in turn, would create the conditions for further investment, and employment growth.

But the future of the sector is not automatically assured, even given favourable economic and trading conditions. In order to fulfil its substantial potential, the paper sector will need to address the problems which have been described in the course of this study.

Addressing the problems will require determination, co-operation, and for many, a new approach to industrial development. But failure to address the problems in a systematic way will threaten the future prospects of the sector.

It is hoped that the major players will make full use of the opportunities to develop their industries to their maximum economic, social and environmental potential.

If these opportunities are used, there is every chance that the paper sector in South Africa will help to lead the way out of South Africa's social and economic crisis — through providing quality, affordable products to consumers, through creating formal employment, and through contributing to sustained economic development.

Appendix 1: Pulp and paper

A 'continuous' labour process

Pulp and paper manufacture is based on continuous process production rather than assembly line production. In continuous process manufacture, a continuous flow of product such as pulp, sugar, chemicals or oil is generated by an ongoing process of production, taking place within closed vessels. Such products are measured by volume, rather than counted individually as discrete products. This is different from the assembly line manufacture of cars, televisions or washing machines, where is product is individually produced on a line, and counted individually.

In continuous process production, workers have little or no physical contact with the product, except at the beginning of the process when it is a raw material, and at the end of the process when it is a finished product. In assembly line production, workers have constant contact with the product at all stages of production. Perhaps for this reason, total quality management, and the worker participation schemes that often go along with that philosophy, took root in assembly line manufacture before continuous process production.

However, the principles behind TQM are beginning to take root in the industry. There are a number of reasons for this, and they have to do with the critical role of the human factor in pulp and paper production.

In some senses, continuous process production is more vulnerable to human error than assembly line production, even though workers are less directly involved with the product. In a continuous process, if a mistake is made, a large volume of the product may be ruined. For example, if too much of a certain chemical is added to the pulp mix, a large portion of the pulp which emerges at the end of the process will be defective. In assembly manufacture on the other hand, a mistake is more likely to result in a single defective product. Also, because continuous process production takes place over many hours, and is hidden in closed vessels, a mistake may not be discovered until eight hours after it was made — and by then it is too late to correct.

Other factors which contribute to the importance of worker skill in continuous process production are the high material-intensity and capital-intensity of the process. A R3 billion pulp and paper mill carries massive overheads, as well as high raw material costs. The impact of either wastage of raw material, or ineffective use of capital equipment can be crippling in such an environment. This implies that there is less margin for human error.

Some of the problems associated with continuous process production have been partially addressed by technological innovation. Process control technology has advanced substantially in the last two decades, and is now able to monitor a wide range of product specifications throughout the production process. If the pulp brightness is too low, or the paper moisture too high, for example, computerised measuring equipment will alert the operator to the problem. But such technology is not the final answer. Once the operator knows that the mix is incorrect, s/he must make a judgement on what has caused the problem and how to solve it. This requires human skill and initiative.

In summary, human skill and commitment in production impact directly on raw material yield and capital productivity, as well as on product quality and consistency. The vulnerability of the process to human error intensifies the need for highly skilled and attentive employees, who are concerned with quality and efficiency.

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